THE ENGINEERING AND MINING JOURNAL.

RICHARD P. ROTHWELL, C. E., M. E.
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NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

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American Institute of Mining Engineers.

THE Washington meeting will commence on Tuesday evening, February 22, 1876, at 8 o'clock, P. M., at the Smithsonian Institution, Washington, D. C.

LOCAL COMMITTEE.

Prof. JOSEPH HENRY, Hon. ABRAM S. HEWITT,
Prof. JULIUS E. HILGARD, Com. LUCIUS M. BEARDSLEE,
Gen. JOHN G. PARKE, Capt. CLARENCE E. DUTTON.

EXCURSION RATES.—By applying to A. L. HOLLEY, 56 Broadway, New York, "persons, delegates, or members (and their families), who are entitled to be in regular attendance," at this meeting, may procure orders, authorizing them to purchase excursion tickets at the rate of about two cents per mile, from Pittsburgh and stations on the main line of the Pennsylvania R. R., and from New York and stations on the New Jersey division of the Pennsylvania R. R. to Washington and return.

Tickets can be obtained on these orders only on February 20, 21, and 22. Return coupons will be good till February 28.

Excursion tickets not good on limited express trains.

Fares.—From New York and return, $10. From Pittsburgh and return, $13.50.

HOTEL.—The Ebbitt House has been selected as a rendezvous. Members wishing accommodations there will please inform the subscriber at the Ebbitt House on February 20, or after.

PAPERS.—A number of valuable papers have been promised, and there will be time for ample discussion.

RECEPTIONS.—Two evening receptions have been tendered to the members of the Institute.

NOTE.—Full evening dress will be desirable, but not indispensable.

MEETINGS AND EXCURSIONS.—One evening session (February 22), and four day sessions are proposed, leaving two half days for excursions about Washington.

A. L. HOLLEY, 56 Broadway, New York.

Resonant Alloys.

A PATENT has recently been granted Prof. B. SILLIMAN, of New Haven, and assigned to the Meriden Britannia Co. of Conn., for a process of imparting resonance to britannia, pewter, white metal, and other alloys, which ordinarily give when struck, only a dull, leaden sound. The process consists in submitting articles formed of these alloys to the action of a regulated and well-determined temperature, just short of their melting-point, for a brief but measured time. This is done in a bath of oil or paraffine, care being taken to avoid contact of water or even of a damp surface, which might cause a steam-explosion, scattering the bath. All contact of the articles with metallic tools, while in the bath must also be avoided. If a rod of less fusible metal touches the alloy under such circumstances, it cuts it like a soldering-iron. The theory of the process appears to turn upon a rearrangement, perhaps a crystallization of the molecular particles.

The Proposed Maryland Coal Tax.

THE State of Maryland is endeavoring to replenish its treasury by imposing a tax of two cents a ton on the mining of coal. As the production of the Maryland mines is somewhat less than two and a half million tons a year, the total proceeds of the tax would not amount to $50,000 a year—a very insignificant matter for the State of Maryland, and less than the "perquisites" of some of her supernumerary office holders; but a considerable sum, nevertheless, for coal companies that are struggling for a bare existence under the combined pressure of low prices and high transportation rates. The tendency in civilized countries, where the minerals belong to the State, as in Belgium, France, Nova Scotia, and elsewhere, has been to *reduce* the royalties, or Government charges on the production of the useful minerals, and especially on coal; the State having much more to gain by the encouragement cheap fuel gives to manufacturing industries, than it could possibly procure from a direct tax on the production of the coal. This policy has been proved both wise and popular; it is therefore much to be regretted that the State of Maryland should take a course that cannot but add to the already too heavy burthens of its principal industry. It must be borne in mind that the mining of coal in the Cumberland region has afforded, during the past two years, but very little, if any, profit to the companies; and in the case of the Consolidation Coal Company has probably been carried on at an absolute loss, it must follow, therefore, that the tax must be added to the selling price of the coal, and it is safe to assume that to the consumer who buys at retail, the tax increases the price ten times what the State collects.

Real estate, including coal in the ground, already pays heavy taxes in Maryland as in other States, and a proposition to again tax the coal when it is mined, seems scarcely more legitimate than to apply a tax on wheat, cotton or other agricultural product. Yet if the proceeds of the proposed tax were to become a fund for the benefit of those who have been injured, or the families of those who have lost their lives in mining, there would be less objection on other than legal grounds. With the successful competition of the Pennsylvania soft coals, and with the prospect of a reduction this season of at least fifty cents a ton (to $4.25 at New York, and $3.75 at Philadelphia,) in the price of manufacturing sizes of anthracite, the price of Cumberland coal will probably suffer a further decline. Instead of over loading this vital industry the State of Maryland should facilitate in every possible manner the cheap production of coal, and not only not impose a tax upon it, but enact such laws as will reduce the exorbitant transportation charges now collected on all coal leaving the Cumberland region.

The Extermination of the Molly Maguires.

THE recent conviction of one of this notorious band of desperadoes at Mauch Chunk, Pa., has been of great service, for it appears to have caused one of his accomplices to turn States evidence, and give information that has been followed by the arrest of at least seven of these infamous characters. The conviction of a few more of them, and, more than all, the knowledge that the authorities know who belong to the band, and what part each has taken in the numerous outrages that have so long disgraced the Anthracite regions, will cause those not arrested to leave that part of the country. It is to be hoped the coal fields will, in future, be free from those outrages that have made them a by-word and disgrace to Pennsylvania Justice.

M'Andrew Redux.

IN clearing away the volumes which have accumulated upon our table, and which we have been prevented by the pressure of other duties from noticing promptly, we come to the REPORT OF THE INSPECTORS OF MINES *of the Anthracite Coal Regions of Pennsylvania for the year* 1874. There are some which have lain there longer; but, Mr. P. F. M'ANDREW must take precedence. If we are correctly informed, this is his last really free and unfettered production; for, though he has been reappointed for a term of years to the position of Clerk of Schuylkill County, rumor adds that the gentleman who gave him another term, did so on condition that the flow of his rhetoric through public channels should be henceforward checked—in short that M'ANDREW should dry up. The gems scattered thickly through the pages before us are therefore doubly precious, as being perhaps the last from the literary vein which M'ANDREW has so long exploited before an admiring Commonwealth. Gems is no longer the word; the deposit has grown massive. Solid chunks of eloquence, wisdom, science, and philanthropy are held between these covers, like ore-bodies in the Comstock lode. Thus, only about one-sixteenth of an inch from the hanging wall, we strike the following *bonanza*, the richness of which cannot be surpassed. There's millions in it:

"The apparent necessity of a continuation of inspection of mines has been fully demonstrated by the subjoined statistics. The importance of the information herewith supplied of the mortality herein exhibited, very forcibly appeals to the sympathy of a generous government for a continuation of the provisions of the act of Assembly, which provides for the safety of persons employed therein.

"The fearful exhibit of casualities resulting in death and severe injuries is to be deeply deplored, besides the great amount of misery it entails upon the widows, orphans, and maimed of this class, that to properly appreciate their case would be but to participate in their distress, and in most cases this distress is extremely severe, whilst a less favored nation than ours would encourage some benevolent measures which would materially ameliorate and stay their suffering.

"The consequent result of these casualities in most cases, destroys forever that glorious boon, the public instruction of those children, and in consequence of such calamities they are cast into a quagmire of ignorance, and in after life debarred from becoming useful members of society; but, on the contrary, become idle and lawless, but when the maternal feelings are aroused by compulsory necessity to procure a means of maintenance for her offspring a resort is had in most cases to the sale of intoxicating drinks, which soon become the resorts of habitual disturbers of good order and law, and a stigma upon our liberal institutions and society at home and abroad.

"By legislative enactment reformatories are established all over the land for the maintenance of paupers, the infirm and destitute, and the great amount of good done by these charitable institutions is highly commendable.

"But so far as distress prevails amongst the families of deserving miners, it only meets with discouragement from sources having the means and ability to institute measures of relief to alleviate their sufferings.

"The portrait here presented is not at all overdrawn, but an actual figure from experience gleaned from acquaintance with orphanages all over the mining regions.

"Compare then, the charitable spirit evinced towards the betterment of the condition of heathens in other land, with that shown to our own poor, and will not a shroud of shame reflect its shadow on our advocates of foreign charities? but our needy people are always amongst us, and custom, which is a proverbial test, proves our sympathies, and often finds us obdurate and unfeeling towards our own sufferers, and with regret we must acknowledge our philanthropy is not adequate to the claims presented for an exhibition of our charity at home.

"Experience amongst the mining classes convinces me that their distress should receive better attention than has been the case. Necessity, nature's first law, forces many of them into the traffic of the sale of intoxicating drinks which they adopt with repugnance from feelings of conscience and religion, knowing too well their domiciles will only become the resort of idle disturbers of order and society."

The advantages of rhetoric were never more clearly shown than in this instance. Stated in common-place English, Mr. M'ANDREW's propositions would be open to troublesome criticism. The apparent argument is, that the infor-

mation herewith of the mortality herein forcibly appeals for a continuation of the law which provides for the safety of persons employed therein. To which it might be objected that as the number of casualties thereabouts was so notably increased, thereafter either the law does not provide for safety thereunder, or it is not properly executed thereby. Perhaps the miners have been following the scientific rules laid down in M'ANDREW's previous reports. If so, it is no wonder that many of them have lost their limbs or lives, only very learned people can safely study M'ANDREW. The harrowing picture of the children playing hookey in a quagmire, and the maternal feelings "aroused by compulsory necessity," selling "intoxicating drinks, which soon become the resorts of habitual disturbers of good order and law," cannot be improved by any comments of ours. But its connection with the business of mine inspection would have puzzled anybody but M'ANDREW. He surmounts such difficulties with superb ease. Like the bold philologer who derived *Moses* from *Middletown* by simply "knocking off the *iddletown* and sticking on the *oses*," M'ANDREW pins together with commas and semicolons whatever propositions arise successively from the profundities of his mighty mind. It is useless to say of any of his deductions that "it don't follow." Anybody can see that it does follow, and what are you going to do about it?

MCANDREW's views on fire-damp having had such a marked effect on the "casualities" of the region, he now goes for the steam engine; and we shall expect to hear of an increase of boiler-explosions and break-downs in consequence. The transcendental science involved in the following definitions will at least make the reader explode, whatever it does for the machine:

"To detail the steam engine of whatever form, we shall only touch upon what is useful in its combination and parts. The divers ty of their construction is illimitable, and to attempt a description in connection with this subject is unnecessary.

"The first grand essential is the cylinder, and may take of any form, but in common use, an elongated cylinder or tube, to which is attached sundry rods, pipes, nozzles, valves, etc., all of which partake of different forms to answer their respecti ve purposes, giving motion to different powers, as eccentrics, levers, hand-gear, etc.

"The eccentric being nothing more than a circular pulley, having an unequal center on its shaft, the counter rods connect the shaft-gear and slide valves, which may be said to be the first power of the engine department; in similarity with the pendulum of a clock, the slide gear describing a movement by force, while the pendulum receives its power by pressure. * * * * Steam boilers should be constructed of the best material known to manufacturers, as steam highly rarified in the steam boiler is of more utility than steam of a moderate soft elasticity, as the subjoined table will exhibit."

The "subjoined table," by one of M'ANDREW's bold transitions, exhibits the names and number of acres of the Philadelphia & Reading Company's coal properties. The highly rarified steam has entirely evaporated!

We notice, by the way, that M'ANDREW, who appropriates (just as SHAKESPEARE did) whatever suits his purpose, but improves it in the using (like SHAKESPEARE again) has been appropriating and improving the materials contained in his own previous reports. Thus this passage about the steam-engine was partially contained in the Report for 1873, and was noticed by us almost exactly a year ago (Feb. 20, 1875) but then the form of steam-cylinder preferred by M'ANDREW was a "longitudinal circle," for which he has, on further consideration, substituted his "elongated cylinder."

But our author is great on gas, this year. Determined not to fall behind the most advanced scientific progress, he has taken from the work of WILLIAMS, published in Liverpool, 25 years ago, some colored atomic diagrams, in which rings and circles of various shades represent the constituents of various mine-gases. These pictures give the false notion that the volume of the products of combustion of fire-damp in air is equal to the aggregate volume of the gas and air before combustion. But this slight defect is swallowed up in M'ANDREW's ingenious commentary, which blends the old and the new chemistry in a masterly way. Thus, after describing carbonic oxide and carbonic acid, he tells us that "carbonous oxide is still another deleterious gas." But he is really sublime on oxygen; in fact, he burns in oxygen with peculiar splendor. Here are some of the sparks:

"Its condition is a gas resembling air, which is only a mixture of many gases. Its characteristics is a colorless, transparent, tasteless, inodorous gas, resembling common air, and possesses the same mechanical properties. The term oxygen signifies air-former * * * * its combining character is termed oxidation, and its separating qualities is termed deoxidation. * * * Oxygen is life; when the oxygen is consumed by respiration or temperature, carbon remains and death is the consequent result."

Exhausted by our admiration of this passage, we cannot be as enthusiastic as we would wish over the statement concerning nitrogen that "its characteristic is suffocation, though so far different when free, that the compounds formed by nitrogen are amongst the most energetic known." Evidently this is the gaseous parallel to M'ANDREW himself, whose energetic compounds, when free, have exploded with notable reports, but whose characteristic henceforward is to be "suffocation."

We see that M'ANDREW complains that he has no chance to read the proofs of his reports, and that, in consequence, many things are misplaced or misrepresented in them. He says "The material in these reports is not any too well arranged when it is sent to the printer, and if any change be made the author should be consulted, so as not to make confusion worse confounded." This is too modest by half. Nobody cares for the mistakes in typography so abundant in these volumes, nor does it make any difference in the sense if passages are misplaced. It is not in the power of any printer to obscure M'ANDREW's genius. Yet we profoundly regret that he did not add to the labors of authorship those of revision also. What a quantity of wisdom would be represented by M'A², that is to say, M'ANDREW multiplied by himself! *

Another Fearful Colliery Explosion.

TELEGRAMS of the 6th inst., inform us that on the previous day 166 lives were lost by an explosion of gas in the Jabin Mine, St. Etienne, Belgium (? France); the report adds,—"The earth is constantly falling in, and the search for the living and dead proceeds slowly under circumstances of great danger."

Coal Production of Combination Companies.

R. G. MOULTON, Esq., furnishes the following statistics of the business of the combined companies for 1875 as compared with 1874:

COMPANIES.	SHIPMENTS TO INTERIOR POINTS. 1874.	1875.	Increase.	Decrease.
	tons. cwt.	tons. cwt.	tons. cwt.	tons. cwt.
P & R. RR. Co.	3,321,890 5	2,999,343 5	..	322,547 –
Delaware & Hudson	1,974,063 –	1,484,141 2	510,078 2	..
Lehigh Valley RR.	2,689,050 9	2,070.545 3	..	618,505 6
Central Railroad	1,584,228 5	1,383,648 16	..	200,579 9
D., L. & W. RR.	863,554 11	1,620,815 4	757,260 13	..
Pennsylvania Coal Co.	174,545 –	184,458 5	10,913 5	..
Total to date	9,606,331 10	9,742,951 15	1,278,252 –	1,141,631 15
		Increase...	136,620 5	

COMPANIES.	SHIPMENTS TO COMPETITIVE POINTS. 1874.	1875.	Quota.	Increase.	Decrease.
	tons. cwt.	tons. cwt		tons. cwt.	tons. cwt
P. & R. RR. Co.	2,240,759 5	1,785,160 16	2,585,000		455 598 9
Delaware & Hudson	1,456,338 2	1,542,117 6	1,837,000	85,779 4	
Lehigh Valley RR.	1,590,422 6	1,231,496 19	1,598,000		358,925 7
Central RR. of N. J.	1,388,058 13	1,277,986 12	1,615,000		110,072 1
D., L. & W. RR.	1,278,978 19	1,318 833 5	1,380,000	39,854 6	
Pennsylvania Coal Co.	1,165,118 2	1,183,749 5	985,000	18,631 3	
Total to date	9,119,675 7	8,339.344 3	10,000,000	144,264 13	924,595 17
				Decrease..	708,331 4

COMPANIES.	TOTAL PRODUCTION. 1874.	1875.	Increase.	Decrease.
	tons. cwt.	tons. cwt.	tons. cwt.	tons. cwt.
P. & R RR.	5,562,649 10	4,784,504 1		778,145 9
D. & H. Co.	2,430,401 2	3,026,258 8	595,857 6	
Lehigh Valley	4,179,472 15	3,302,042 2		877,430 13
Central Railroad	2,972,286 18	2,661,635 8		310,651 10
D., L. & W. RR.	2,142,533 10	2,939,648 9	797,114 19	
Pennsylvania Coal Co.	1,338,663 2	1,368,207 10	29.544 8	
Total to date	18,626,000 17	18,082,295 18	1,422,516 13	1,966,227 12
			Decrease.. ...	543,710 19

NEW PUBLICATIONS.

THE fourteenth volume of APPLETON'S *American Cyclopedia*, though it happens to contain few important articles on mining or metallurgical topics, is not behind its predecessors in scientific, literary, historical, or political matters. Gen. WILSON'S article *Railroad*, and Prof. THURSTON'S *Roof*, are excellent summaries; Prof. MAYER contributes *Pyrometer;* while such specialists as RICHARD GRANT WHITE and Prof. W. D. WHITNEY are represented in the articles *Shakespeare* and *Sanskrit*. We notice also, as particularly interesting to us (outside of our narrow editorial and professional sphere) the titles *Provençal Language and Literature Pyramid*, *Russia*, and *Rain*. As this work approaches completion, its superiority as a popular cyclopedia over everything else in that line now before the public becomes more and more apparent. The careful and skillful editorial staff has been reinforced at every step by the expert assistance from outside; and though, as we understand, the publishers have spent on the work more time and more money than was at first thought necessary, there can be no doubt that these outlays will be rewarded by an enduring popularity, evinced in large and steady sales. *

The Largest Blast-Furnace Yield in the World.—791 Tons a Week, With 31 1-2 per cent. Ores.

MR. THOMAS WHITWELL, the inventor of the hot blast stove, sends the following communication to the *American Manufacturer:*

"THORNABY IRON WORKS, STOCKTON-ON-TEES, Dec. 21, 1865.

"We hear so much in your wide-spread paper of the make of Isabella or Lucy as the largest in the world, but I send you the following details which I shall be glad to see surpassed even in America:

(Translation.)

Esch sur l'Alzette, le 19 12, 1875. GRAND DUCHE DE LUXEMBOURG.

MONSIEUR WHITWELL.—In reply to your letter of 13th of December I give you the information demanded. We have produced in 1874, with the No. 1 furnace (4 WHITWELL's hot blasts), that which follows:

23 July,	117 tons.		30 July,	112 tons.	
24	" 116	"	31	" 117	"
25	" 116	"	1 Aug,	113	"
26	" 112	"	2	" 111	"
27	" 111	"	3	" 109	"
28	" 113	"	4	" 111	"
29	" 115	"	5	" 109	"

14 days. 1582—14=113 tons per 24 hours, or per week, 791 tons. Metallic iron in charge 31.5 per cent.; height of furnace, 65 feet; bosh, 23 feet; greatest production, 119 tons in 24 hours, once. Receive, Monsieur, my salutations the most distinguished. E. FISCHER.

We are fully aware that the make of the Isabella and Lucy is with the richest ore in the world, requiring only 30 cwt. to make a ton of iron. The Luxembourg furnace is on poor oolitic ore, 31½ per cent., requiring 65 cwt. to make a ton of iron. It is 10 feet less in height than the Lucy and Isabella, and the coke is Belgian, with 18 to 20 per cent. ash. I think your readers will be able to decide which furnace does the most work. THOMAS WHITWELL.

Iron and Carbon, Mechanically and Chemically Considered.*

By JOHN B. PEARSE, Philadelphia, Pa.

CONTINUED FROM PAGE 127.

MECHANICAL TESTS OF NEUBERG STEEL.

No.	Grade given by Smith.	Tenacity, Lb. pr. sq. inch	Extension, per cent.	Tenacity of subgrade previously determined.	Tenacity of grade.
18	7 soft.	62,669	29·7	57,500	
		61 292	30·0		
17	7	59,111	30·0	62,000	
		64,162	29·4		
		64.276	29·0		57,500
		59,915	30·5		to
16	7 hard.	69,442	27·0	65,500	69,000
		64,619	29·4		
		64,162	31·4		
		64,850	30·8		
		67,719	28·0		
15	6 soft.	63,817	31·0	69,000	
		54,619	35·6		
		71,852	28·0		
		64,390	20·0		
		74.147	23·8		
14	6	64,276	29·8	73,500	
		69,556	23·7		
		75,525	24·0		
		66,572	24·5		69,000
		78,500	26·0		to
		80,920	26·7		80,000
		79.372	21·8		
		80,920	26·7		
13	6 hard.	69,097	25·5	78,000	
		74,607	26·5		
		88,036	24·5		
		77,132	25·7		
		85,740	16·8		
		74,607	23·0		
		88,839	19·0		
12	5 soft.	78,509	24·5	82,500	
		85,261	24·0		80,000
		90,676	21·2		to
11	5	75,869	20·0	92,000	100,000
		92,627	23·2		
		99,399	15·0		
8	4	99,514	4·0	113,500	
2	2	130,963	3·0	....	

You see from these tests that the smith usually kept within the limits of the subgrade and did not go outside the number, except in two cases, in subgrade 13. In the harder numbers, seldom made, you see the grading is almost equally reliable. All these experiments were made without reference to the smith, and, so far as I know, he was never made acquainted with the results. The fact that a man can distinguish and sort steel so closely at his anvil, shows that the characteristics exhibited by the various grades are actual and tangible. This being so, the fact that the above statements are exact, is sufficient to show the great importance of accurate knowledge of this kind, both to maker and user.

It is most strange that this knowledge is so little disseminated in this country. From what I have heard in public from intelligent steel-makers, one, not knowing otherwise, might suppose such knowledge did not exist at all. But it does exist in rich store, wrought out in detail with care. I can assure all parties that by securing the services of a competent chemist familiar with the subject, and then experimenting on a definite basis, they can, in a short time, refer to these details of their business with greater certainty than they now refer to their books.

The Neuberg steel is of a very high grade, and the then small product was mostly worked into tyres and boiler plate. The latter has been exclusively used by HASWELL, of Vienna, for his locomotives, boilers and all, for many years. The tests show great regularity in the steel, since they agree well in their grades, though made somewhat at random as to date. But, I believe our Bessemer works in this country now turn out a product much more regular than the one we have been discussing. The steel commonly used in this country, would come under the subgrades 13, 12, and 11, being usually made between 0.36 and 0.45 per cent. of carbon. In regular work with us, there is no need of varying more than 0.05 per cent. carbon, even when blowing by the eye. I have kept the turn averages for weeks between 0.39 and 0.42 per cent., without trouble. I may be allowed to state here, that so far as my experience goes, I believe Bessemer steel as now made, is the most regular product in the whole metallurgy of iron. I have, for instance, examined good iron merchant bars and rails by the Eggertz process, and find the variation in the same lot is often 0.25 per cent. carbon, and the parts richest in carbon are often distributed, at intervals, through the bars.

Seeing, then, that carbon is such an important element in iron, it is needless to say that the history of its determination has been a most interesting one. It began practically with BERZELIUS, who laid a wonderfully good foundation in this matter, as he did in so many others in chemistry. But KARSTEN was the first to apply the processes, suggested previous to his time, systematically to the analysis of iron, discovering, among other things, the true nature of graphite. He did wonderful work with a process (*chloride of silver*) that required 10 to 20 days for a single estimation. Imagine, if you please, the despair of a modern chemist under such circumstances at a works temporarily making bad steel.

In this case before us, hydrogen and oxygen are Scylla and Charybdis for the carbon. If acids, acting by substitution, are used, the hydrogen evolved carries off carbon as a volatile oil or as gas, while if oxidizing acids are used, the carbon is oxidized as completely as the iron. To avoid these fatalities BERZELIUS originated the chloride of silver process, in which a lump of iron, laid on a lump of fused chloride of silver, reduces the silver, and a mass of carbon, silica, etc., is left on the partly reduced silver chloride. The contact of air was injurious, and the operation required ten to twenty days. It was, however, the best process in his time and long afterward. He also recommended chloride of copper, which attacked energetically, but deposited copper, and had a tendency to form a difficult soluble subsalt. To avoid this difficulty, FUCHS proposed the use of perchloride of iron, which leaves an iron subsalt easily handled. BERZELIUS tried dry and pure chlorine gas, which forms a volatile chloride, which can be separated from the carbon by sublimation, using also bromine instead of chlorine. BERZELIUS further recommended the combustion of carburetted iron, heated to redness, in a current of oxygen, and also a fifth method, based on slowly dissolving the iron by a dilute solution of absolutely pure nitric acid ; also the use of sulphate of copper with common salt. In all six methods unreliable, though highly suggestive, and another good but slow.

BERTHIER determined that the dilute nitric acid process was entirely unreliable, owing to the partial conversion of the carbon into humus. He found that the methods based on determining the carbonic acid resulting from the carbon viz. : (*a*) by fusion with saltpetre ; (*b*) by burning in oxygen ; (*c*) and by heating with metallic oxides (as litharge oxides of quicksilver and copper) were all unreliable, since they required the iron to be *powdered*, thus affording both an irregular average and a mass difficult to act upon. A method based on the use of a solution of chloride of lime as a solvent was condemned by the strong evolution of hydrogen, though it was somewhat rapid. BERTHIER found the chlorine process open to loss by the presence either of air or moisture, and protested against the use of chloride of ammonium as a solvent, because it evolved hydrogen and acted slowly. BERTHIER considered the chloride of silver process inaccurate in presence of much silicon in the iron, since silicon, during its oxidation, frees hydrogen. He proposed the use of bromine and iodine in water, but found the results uncertain in presence of much silicon, though very convenient. BERTHIER gave, as the best process known to him, one based on the slow oxidizing action of air. Finely powdered iron was well wet in a porcelain mortar and exposed to the air, being thoroughly stirred daily, the oxides and carbon being then poured off and collected. By adding salt the operation could be completed in 8 or 10 days. The iron oxide was then dissolved, and the residue weighed and burnt off, the carbon being determined by the loss.

REGNAULT* originated the use of chromate of lead (80 grammes) and chlorate of potash (5 grammes) in a combustion tube. He depended on the chromate to oxidize the iron (5 grammes), using the chlorate in a separate part of the tube to evolve a large excess of oxygen to complete the operation.

KARSTEN found REGNAULT'S process reliable for total carbon, but preferred the chloride of silver process, by which all his determinations were made; which, as he himself afterward said, have been confirmed by later analysis. KARSTEN found the chlorine process liable to great error from the tendency of the chloride to condense and fill the tube. He experimented with corrosive sublimate as a solvent, but found its action slow, and the formation of calomel embarrassing. He found BERZELIUS' chloride of copper method the best of all similar methods, but inaccurate when the solution was heated above 5° to 8° Reaumur, but stated that at that temperature the loss of carbon by evolution of hydrogen was inconsiderable. After the complete solution of the iron the precipitated copper was redissolved with muriatic acid. KARSTEN, as you know, discovered that graphite was pure carbon, allotropic but not as previously supposed, a compound of carbon and hydrogen. Influenced by this new idea, he condemned all processes for total carbon which operated in a watery solution because, in his opinion the carbon liberated was a compound with hydrogen and not pure. Graphite, he determined, by dissolving in *aqua regia*, and treating the insoluble residue with a strong caustic potash solution.

KARSTEN† remarks that none of these processes are absolutely accurate, because the changes which the carbon undergoes on liberation are unknown, and thus one cannot select that method as the most accurate, which yields most carbon, since no method defined the state of combination of carbon and iron.

On comparing‡ the accuracy of the respective methods he found, in a Spiegel iron from Sagnerhütte :

1. Oxide of copper combustion	4 2855	per cent.	Combined	Carbon.
2. Regnault's method	5 7016	"	"	"
3. Chloride of copper	5·6250	"	"	"
4. Perchloride of iron	5·3549	"	"	"
5. Chloride of silver	5·6645	"	"	"

He did not agree with BERTHIER in finding fault with the chloride of silver process.

WÖHLER§ modified BERZELIUS' chlorine process by using a boat in which the iron is placed, and, after thorough decomposition by chlorine the boat is transferred to another tube when the residue is burnt in a current of oxygen.

BROMEIS‖ modified REGNAULT'S method by mixing the iron with equal parts of chromate of lead and chlorate of potash, thus insuring thorough action. But on the other hand this modification was thought by ERDMANN and MARCHAND¶ to be open to the objection of developing free chlorine at the high temperature of combustion while MARIGNAC observed that oxygen derived from chlorate of potash is not free from chlorine.

MULDER** found that the mixture of chromate of lead and chlorate of potash, as advised by REGNAULT, would not develop the least chlorine, but that chlorine *is* disengaged so soon as the chlorate of potash predominates over the chromate of lead. He found chromate of lead alone insufficient to burn off the graphite nor would oxide of copper do so without the aid of a current of oxygen. MULDER preferred direct combustion in the oxygen current. He found in cast iron :

1. Direct combustion in oxygen	5'3 to 5'13	per cent.	Total	Carbon.
2. Regnault's method	3'77	"	"	"

BOOTH and MORFI†† disapprove of REGNAULT'S (BROMIES') process with fused chromate of lead and chlorate of potash, as somewhat doubtful, and requiring *pulverization*, an operation they regard as destructive to the accuracy of the sample. They found the chloride of silver process highly accurate, but so slow as to require 10 to 20 days to dissolve 5 grammes, and liable to be greatly retarded by the formation of a hydrated peroxide in the entrance of air into the digesting vessel. They considered the chloride of copper method objectionable on account of the loss of carbon as a carbo-hydrogen gas. After repeated trials they found that the use of iodine (5 grammes to 1 gramme of iron) with little water *in the cold* was the most accurate and expeditious process at their command. The residue was washed and weighed on a counterpoised filter with subsequent ignition to determine impurities. Great precaution is requisite to

* Paper read before the American Institute of Mining Engineers, at the Cleveland Meeting, October, 1875.

* Ann. d Chem. u. Pharm., xxx, p. 352.
† Eisenhüttenkunde I. p. 395.
‡ Archiv. f. Min., Geog., Bergb. u. Hüttenkunde, xxi., p. 500.
§ Chem. News, 1867, p. 94.
‖ Ann. d. Chem. u Pharm., xliii, p. 241.
¶ Journal für praktische chemie, xxxi, p. 275.
** Chem. News 1862, p. 5.
†† Experiments on metals for cannon, pp. 402-404.

temper the action of the iodine; if a sand bath heat were used the carbon found would be 20 to 60 per cent. too low. The process, too, required at least a day.

BINKS* originated the idea of removing the hydrogen altogether from the metal by dissolving in dilute *pure* hydrochloric acid, by electrolysis, in a single voltaic arrangement with platinum. Practically, however, some evolution of hydrogen takes place on the metal. WEYL† used this method and specified the precaution of using a weak current. He stated that in this way 5 to 6 grammes of iron could be dissolved *in a few hours*, the carbon retaining the original form of the iron.

RICHTER,‡ of Leoben, preferred the chloride of copper process, and found that the difficulty caused by the re-solution of the precipitated copper and subsalt could be largely avoided by using either salt or chloride of potassium, in connection with chloride of copper. This addition greatly facilitated solution.

ULLGREN discovered the fact that the carbon obtained by sulphate of copper could be readily burnt off without heat in strong sulphuric acid, to which *chromic acid* was gradually added, the carbonic acid being absorbed by potash in the usual way. He found it increased the accuracy of the determination to avoid handling the carbon, and washed by decantation, removing the whole precipitate, with very little water, direct into a flask.

With the work of our ordnance corps as a basis, the British Government instituted experiments with reference to the manufacture of cast-iron ordnance. Mr. ABEL§ made an exhaustive report on the subject. Greatly to my surprise I found he had chosen an *acid solution of chloride of copper* as solvent, burning the residue with oxide of copper in a current of oxygen. He thus needlessly intensified the inaccuracy of the process.

The experiments developed the interesting fact that, while the average of attainable metal was too low for ordnance, the limits of English iron were as follows:

Cast Iron.	Specific Gravity.	Tenacity.
From sandy brown hematites and coke (minimum).....	6·886	4·85 tons.
From hematites, or argillaceous carbonates, with cold blast (maximum).....	7·289	14·05 "

BUCKNER‖ states that he found that *with care* BERZELIUS' chloride of copper method, WEYL's (BINKS') by electrolysis, and WÖHLER's with chlorine and oxygen gave quite concordant results. But he does not deny HAHN's statement that, even with neutral chloride of copper, an evolution of hydrogen, containing carburetted compounds, takes place. He finds the error due to this cause small, when *absolutely neutral chloride of copper* is employed, and found, in a spiegel-iron, by the chloride of copper process, only 0·04 per cent. less carbon than the amount given by WÖHLER's process.

KERL states¶ that, in the laboratory at Clausthal, WÖHLER's process was found both the most convenient and the quickest.

FRESENIUS** suggested a method of determining carbon by solution in dilute sulphuric acid, passing the resulting gases over red-hot oxide of copper, collecting the insoluble residue and burning it off in oxygen, adding the weights of the two portions of carbonic acid to obtain the total. This is a double process when a single one should suffice, nor is it applicable to iron containing much carbon.

SCHNITZLER†† estimated, carbon in the *same steel*, by WEYL's (BINKS'), BERZELIUS' chloride of copper, and FRESENIUS' method with the following results. He found the first method too low, through evolution of hydrogen:

1.	WEYL's (BINKS) method ..... 0·75	5.	BERZELIUS' chloride of copper....0·96
2.	" " " .....0·74	6.	FRESENIUS' method.....0·92
3.	" " " .....0·68	7.	" " .....0·92
4.	BERZELIUS' chloride of copper....0·93		

Now TOSH‡‡ compared the accuracy of different methods in WÖHLER's laboratory. He confirmed BOOTH and MORFIT's opinion of REGNAULT's (BROMEIS') process with fused chlorate and stated FRESENIUS' process was defective in requiring complicated apparatus, unusually great care and too much time. Proving WEYL's (BINKS') process inaccurate, through evolution of hydrogen, he selected WÖHLER's process as the best, because, while affording results of equal reliability with any, it required much less time. In the same sample of cast iron TOSH found

1.	REGNAULT's (BROMEIS') method	3·886	per cent.	carbon.
2.	" " "	3·996	"	"	"
3.	WEYL's (BINKS') method	4·235	"	"	"
4.	" " "	4·086	"	"	"
5.	FRESENIUS' method.....	4·244	"	"	"
6.	" "	4·166	"	"	"
7.	WÖHLER's "	4·348	"	"	"
8.	" "	4·367	"	"	"
9.	" "	4·327	"	"	"

EGGERTZ§§ ascertained that the residue left, by the action of iodine, on cast iron and steel, consisted, mainly, of silica and a compound of carbon, iodine, and water, unaltered by heat, under 110° Centigrade. After deducting silica, the compound was found to have an uniform composition, containing, on an average, 60 per cent. carbon. BOOTH and MORFIT's process is followed, but the 60 per cent. of the loss on ignition, instead of the whole, is reckoned as carbon. An estimation required 1½ days.

But, though we have in our list the names of many distinguished chemists, it is clear that, notwithstanding the labor expended on the subject, no reliable process had been developed entirely convenient and quick enough for practical use. The chloride of silver process was far too slow, the iodine slow, and not permitting the use of large amounts of the iron, and WÖHLER's chlorine process highly disagreeable to execute.

There are two necessities in a steel works laboratory; first, entire accuracy, and, second, great speed of processes.

As to accuracy, it may, in one sense, be said to be a comparatively small matter in 4 per cent., to be, 0·1, in error; but, when one must work between the narrow limits of 0·30 and 0.50 per cent., even 0·02 per cent. becomes a considerable error. We have seen there is no substantial agreement, among our authorities, as to the best process, and that 0·04 per cent. is an ordinary variation for the same sample, by the same process. The fact, that the processes, reputed best, varied, on the same sample, 0·5 to 0·6 per cent. among each other in less than 5 per cent., did not represent such an agreement as to induce confidence.

The carbon, in standard steel I had in use, had been determined by REGNAULT's (BROMEIS') process, of which I was not, as above, perfectly sure, and I felt it necessary to have the carbon determined by a process giving results varying less than 0·02 per cent. With this view I suggested to Mr. ANDREW S. MCCREATH, then chemist of the Pennsylvania Steel Works, whose business I managed, that he should try the most favorable of the above processes, as he found leisure, and select the most accurate one. I also suggested that the use of a double chloride of ammonium and copper would, probably, be best adapted to our wants, both as to accuracy and facility.

In the course of a year or more, Mr. MCCREATH made 36 determinations of carbon, in the same sample of steel, by seven different processes, each being, on re-determination, modified to avoid objections.

REGNAULT'S (BROMEIS') PROCESS.

Fused chromate of lead and fused chlorate of potash.

Determination made at a *high heat.*

1. Per cent. carbon .....0·567
2. " " .....0·600

Determination made at a *medium heat:*

3. Per cent. carbon.....0·524
4. " " 0 520
5. " " .....0·524

Determination made at a medium heat, and nitrate of silver interposed on pumice, before potash bulbs, to retain chlorine:

6. Per cent. carbon.....0·534

WÖHLER'S PROCESS.

Separation by chlorine and combustion in oxygen:

7. Per cent. carbon .....0·567

IODINE PROCESS.

EGGERTZ' modification. Sixty per cent. of carbon compound, taken as carbon:

8. Per cent. carbon .....0·468
9. " " .....0·468
10. " " 0.468

Combustion of *residue* in *oxygen:*

11. Per cent. carbon.....0·532

Combustion of *residue* in *chromic acid*, (ULLGREN):

12. Per cent. carbon.....0·513
13. " " 0.508

Combustion of residue in *oxygen*, but *sulphuric acid interposed* before potash bulbs:

14. Per cent. carbon.....0·508

SULPHATE OF COPPER PROCESS.

With chloride of copper; and muriatic acid to assist in re-solution of copper. ULLGREN's combustion of residue in *chromic acid*, but with soda lime to absorb carbonic acid:

15. Per cent. carbon.....0 080

Combustion in *chromic acid*, but *potash* bulbs used, as usual:

16. Per cent. carbon .....0·373
17. " " .....0·316
18. " " .....0·368
19. " " .....0·376

Combustion of residue in *oxygen:*

20. Per cent. carbon.....0·414

CHLORIDE OF COPPER PROCESS.

With addition of *salt* and use of counterpoised filters for ascertaining weight direct:

21. Per cent. carbon.....0·520

With *hydrochloric acid* to re-dissolve copper in ordinary way:

22. Per cent. carbon.....0·430

Combustion of residue in *chromic acid*, but with chloride of calcium tube, instead of sulphuric acid wash bottle:

23. Per cent. carbon .....0·472
24. " " 0 442

ABSOLUTELY NEUTRAL CHLORIDE OF COPPER.

Muriatic acid, used carefully, after solution of iron:

25. Per cent. carbon.....0·496

DOUBLE CHLORIDE OF COPPER AND POTASSIUM.

This was rather a mixture of the two salts than a double chloride as the two salts seemed to have little tendency to form a double salt. Requires acid to re-dissolve copper.

Combustion of residue in *chromic acid*, but *soda lime* used as absorbent.

26. Per cent. carbon.....0·401

Combustion in *chromic acid*, but *potash* as absorbent as usual.

27. Per cent. carbon .....0·510
28. " " 0 519

Combustion of residue in *oxygen.*

29. Per cent. carbon .....0·494
30. " " .....0·504
31. " " .....0·502

DOUBLE CHLORIDE OF COPPER AND AMMONIUM.

There is no trouble in forming a perfect double salt-*neutral* on re-crystallization. *No acid required* to re-dissolve copper. Combustion in *chromic acid.*

32. Per cent. carbon.....0·490
33 " " 0 502

Residue weighed on *counterpoised filters:*

34. Per cent carbon.....0·500
35. " " .....0·510

It is evident that REGNAULT's method gives discordant results, as do also WÖHLER's, ULLGREN's, EGGERTZ' and the chloride of copper process, as ordinarily used. It is also clear that *soda* lime is a very defective absorbent. On comparing the other reliable results we have—

	per cent. carbon.
No. 12. Iodine.....	0·513
" 13. "	0.508
" 14. "	0·508

* Society of Arts, 1857. *Chemical News*, 1862, p. 252.
† Zeitschrift d. V. Deutscher Ingenieure, 1861, p. 224.
‡ Leoben Jahrbuch.
§ Cast-iron Experiments, 1858.
‖ Berg. u. Hüttenmann. Zeitung 24, p. 84.
¶ Berg. u. Hüttenmann. Zeitung 24, p. 85.
** Zeitschrift Analytische Chem. IV., p. 69.
†† Zeitschrift Analytische Chemie. IV., p. 78.
‡‡ *Chem. News*, 1867, p. 67, 94, 169.
§§ PERCY, Iron and Steel, p. 891. Translated by SANDBERG.

No. 25.	Absolute neutral chloride of copper		0·496
" 27.	Double salt (?) copper and potassium		0·510
" 28.	" "		0 519
" 29.	" "		0·494
" 30.	" "		0 504
" 31.	" "		0·502
" 32.	Double chloride ammonium and copper		6·490
" 33.	" "		0·502
" 34.	" "		0·500
" 35.	" "		0·510

The average of these 13 determinations is 0·504 per cent.

You see the average of the absolutely neutral chloride of copper solution with combustion in chromic acid is 0·496 per cent.; the average result of the ammonium double-chloride is 0·500[5] per cent.; that of the chloride of copper and chloride of potassium is 0·506 per cent.; while the average of the iodine determinations with combustion in chromic acid and one in oxygen is 0·509[6] per cent. of carbon.

As to *accuracy*, the ammonium double-chloride and the potassium salt are nearest the general average, and of the two the double-chloride of copper and ammonium exhibits the lest variation.

As to *speed* and *facility*, however, the results are decisively in favor of the ammonium double-chloride method.

A determination by REGNAULT'S process takes at least two hours.

Solution in iodine and combustion in oxygen takes six hours, as it is necessary to dry the residue on asbestos, before burning off. Combustion in chromic acid shortens the process to about four hours. This is with a small amount of metal, say 1 gramme; if 5 grammes were to be used, the solution above would require at least three hours.

Solution in chloride of copper is tedious, must be made in the cold, and the action of muriatic acid on the precipitated copper is slow, as strong acid or warmth would destroy the carbon. The sulphate of copper is also tedious. Either of these methods requires 5 to 6 hours under the most favorable circumstances.

With the mixture of poiassium chloride, with chloride of copper, action is not very rapid, and a slight precipitation of copper takes place, so that acid is required for its re-solution. A solution requires 2 hours.

With the ammonium double chloride, the action is extremely rapid; 3 to 5 grammes of metal are completely dissolved in the cold in 10 to 15 minutes. Heat does no harm. The solution is so neutral that on heating, a slight precipitation of peroxide of iron takes place, which is taken up by a drop or two of muriatic acid. In 25 minutes the carbon is filtered and ready for combustion in chromic acid, which can be completed in three quarters of an hour. By using counterpoised filters, 3 to 4 determinations can be made in 1½ hours, since they can be made together; whi e a chromic acid combustion requires more devoted attention. Where little silicon is present, as in Bessemer steel, the counterpoised filters answer admirably; when more silicon is present the chromic acid determination is preferable. When the ammonium double chloride is used in excess, 520 grains double salt to 75 grains metal, as all the chlorides must be used, the process leaves nothing to be desired for entire accuracy, easy working, and rapidity, and I am happy to say that, in my opinion, the long struggle over accurate determination of combined carbon in iron is thus brought to an end.

The carbon, in the sample treated above, by Mr. MCCREATH, was also determined by the following analysts:

Prof. OSCAR D. ALLEN, by the chloride of copper method, with combustion in oxygen:

1.	Per cent. carbon	0.43
2.	" "	0.45
3.	" "	0.45

Mr. T. M. DROWN, by the chloride of copper method and combustion in oxygen:

1.	Per cent. carbon	0.470

Messrs. BOOTH & GARRETT, by REGNAULT'S process:

1.	Per cent. carbon	0.503

These results show that the chloride of copper process gives uncertain determinations, and corroborate Mr. MCCREATH'S work. The extreme difficulty of procuring neutral chloride of copper is a decisive objection to its use.

I have requested Mr. MCCREATH, now Chemist to the Second Geological Survey of Pennsylvania, to write out a detailed description of the methods used to insure accuracy, and of the double chloride of copper and ammonium process. And in this connection I desire to ask the various Bessemer works of the country to send me their standard steels (to 223 Market Street, Harrisburg), for comparison by this method.

Treasure Hill, White Pine, Nevada.

Special Correspondence of the ENGINEERING AND MINING JOURNAL.

TO THE EDITOR: SIR—Allow me to make a rapid reference to the above caption, for aside from its special mineral organization, it has other characteristics that peculiarly entitle it to remark. At nine thousand feet above sea level, it is the loftiest *habi'at*, with an exception in Colorado, in the United States; and such an elevation would seem, to a lowlander, to entitle it to reprobation as the home of storm and frost, when, in fact, it has an amenity of climate unknown to the Atlantic coast, at a lessened elevation of eight thousand feet. The climate is distinct from that of your seaboard, the isothermal line rising many degrees north of you, our seasons being governed by those of Western Mexico. The winter commences late in November, with brilliant crisp weather, till Christmas, then snows extending to April, rarely exceeding three feet in depth, with a thermometer rarely as low as zero, and only once in seven years touching 10° below. None of the colds and inflammations that afflict low countries, and free from pneumonia, with an open fire and an abstinence from crooked whiskey. April and May are fickle, infested with snow squalls into June, when the rainy season commences, with an occasional shower till August, from whence, till winter, the benignity of the weather secures rapturous approbation. The summer air is electric, the cook-stoves playing fantastic tricks on their amazed occupants, each hair in the horse's tail repelling its fellow, and in passing up the mountain with a Mr. NELSON of your city, he will recollect my drawing repeated electric sparks from his face, as though he was a reservoir of the subtle fluid. In addition to the charm of the climate, the freedom from insect annoyance cannot be too highly appreciated. No flea, gnat, mosquito, or bed-bug, is generated to torture humanity. Snakes are unknown, and about five per cent. of the usual number of flies constitute the only nuisance. Bunch grass and sage brush interlard the sparse bodies of mahogany, cedar, white and nut pine, the native inhabitants of which are coyotes, rabbits, and ground squirrels, with now and then a sage-hen. A lowlander, ascending from Hamilton to Treasure City, a thousand feet of an elevation, becomes breathless, and it requires a month or two to expand his lungs sufficiently to endure any great fatigue. After that the rarity of the atmosphere is a constant charm, not a particle of malaria is inhaled. The sexual impulse is mitigated to a degree that has not been noted, and lung affections, with consumptive tendencies, are readily removed. The view from the summit of Treasure, or rather that of the adjacent White Pine Mountain, has a radiation of one hundred miles, covering several ranges of parallel mountains, and presenting some striking scenes; Jeff Davis Peak, to the east, rising 12,000 feet, and the Huntington Valley, extending one hundred miles towards the Colorado, and a like distance to the north, to the Humboldt, are in view. On the whole, barren and austere as it seems, no part of New England or New York can, in summer or winter, compare with it for healthfulness and geniality of climate, and to my view the reorganization of the spring months is the only benefaction that could be bestowed on it. In another letter, reference will be made to the remarkable mineral constitution of Treasure Hill, and I will content myself now with dissipating any apprehensions had respecting climate, by those who may be tempted in future to explore its treasures.

C.

Reduction of Gold and Silver Ores by the Hunt & Douglas Process.

TO THE EDITOR: SIR—In your editorial of the 25th of December, commenting on the burning of Mr. STEWART'S reduction works in Georgetown, Col., after referring to Mr. STEWART'S unfortunate adoption of the AIREY & STETEFELDT furnaces, you say: "On the other hand, the obstinate rejection of the Brückner cylinder, which is, and has long been, well known as a successful apparatus for chloridizing roasting, cost Mr. STEWART dear; and his determination to beat that apparatus rather than adopt it, has, probably, led him into several ill-advised schemes. The last of these was the HUNT & DOUGLAS copper process, against which, from the chemical standpoint, nothing—but from the economical standpoint, in its application to Colorado argentiferous ores—a good deal can be said."

Mr. STEWART'S very enterprising spirit has certainly cost him a good deal of money, and it may be his prejudices which prevent him using the Brückner cylinder. On that point I do not express an opinion. But he certainly differs *in toto* from you as to the advantage of using a bath of the chlorides of iron and copper in the treatment of even Colorado ores; and from fifteen months' experience has satisfied himself that by doing so a much more thorough extraction of the silver can be effected, and that at very trifling cost, than simple amalgamation previously enabled him to effect

The plan he adopted in his old mill was to mix, when he could get it, sufficient auriferous copper ore from Empire with the Georgetown argentiferous blende and galena to give him about one half of 1 per cent. of copper in his charge; and to chloridize this in the usual way. But before amalgamating he agitated the chloridized pulp with a solution of chloride of iron and brine in shallow tubs. During the agitation concentrated sulphurous acid fumes were passed over the surface of the bath. The result was that the copper was kept in solution during the whole run; for as rapidly as it was thrown down by the oxides of zinc and lead present in the charge, it was re-dissolved by the proto-chloride of iron; and it (the proto-chloride of iron) was perpetually regenerated from the precipitated peroxide of iron by the sulphurous acid fumes. He was able, therefore, to retain in solution copper equal to 40 lb. of blue stone to the ton during the whole run; and this certainly acted most energetically on the sulphide of silver which had escaped chloridization in the furnace, for he writes me: "Whenever we had any copper in the ore or could obtain any, the HUNT & DOUGLAS bath would chloridize the silver as high as 96 to 98 per cent. As for the cost, it took very little extra salt, and took no more labor with the leaching than it did to amalgamate without it, so that, both chemically and commercially, it is a thorough success. It would have paid us largely to have brought oxide of copper from some place or another at any price, or even cement copper and then converted it to oxide, for when we had the least color of copper in the bath, the silver was always nearly all extracted, and when we could not get copper it would fall down ten and fifteen per cent., and on ten tons a day of 150 oz. ore, the loss would be $150 to $250 a day."

The chloride of iron and brine, with silver and copper in solution, he passed through two series of tubs of about fifty gallons capacity each, which certainly did not cost him much—the first series filled with scrap copper, the second with scrap iron; by which he separated the silver from the copper, when the bath was fit for use over again. As the brine did not extract the chloride of silver perfectly, he ran the partially exhausted pulp into his amalgamators, where he obtained an amalgam much freer from base metal than if the pulp had not been previously leached.

The plant did not cost him much—no extra labor was employed in carrying through this additional operation, and unless Mr. STEWART be a very unreliable man, it was attended with great benefit.

That the usual method of throwing into the pan a handful of blue stone which almost immediately disappears precipitated either as oxide by some base metal oxide, as zinc or lead oxide, or as metal by the iron of the pan, should be productive of no good, cannot be wondered at; but I think you will admit that if silver ore be exposed for a considerable time to a notable quantity of copper as chloride, its action cannot fail to chloridize silver, which had passed as sulphide through the furnace.

We believe our chemical standpoint is unassailable, and Mr. STEWART, who is a good judge, and who has been applying our chemistry to practice for over a year, is certain his economical standpoint is so also.

J. DOUGLAS, JR.

PHŒNIXVILLE, PA., Feb. 2, 1876.

Utah Mines and Ore Markets.

Special Correspondence of the ENGINEERING AND MINING JOURNAL.

SALT LAKE CITY, Feb. 1, 1876.

TO THE EDITOR: SIR—This has been an unprecedently busy Winter for the mining and smelting interests of Utah. Indeed, smelting for the year 1875 seemed to commence in the Fall, and, should the present activity continue, 1876 promises to double the ore and bullion products of 1875. Since last Fall eight of the smelting works in this vicinity have been constantly running, the most of them having two furnaces in blast. An average daily consumption of thirty-five tons of ore at each of the works is a rather low estimate, and shows an output of nearly three hundred tons a day from the mines. Much more than one-half of this comes from Bingham, from twenty to thirty

tons from Cottonwood, exclusive of that shipped from the Flagstaff mine, the remainder being furnished by the Hidden Treasure, Flavilla, Chicago, and other mines in Dry Cañon. The starting of the LILLY, LEISENRING & Co.'s works at Stockton, has infused some life into that district, and mine owners have reopened prospects which have lain idle for several years. As the Waterman Works depended entirely upon the Hidden Treasure mine for their ores, the Chicago Company had no competitor for ores in that market, and prices ruled so low as to render the mining of low grade ores unprofitable. The starting of the new works has advanced prices 15 per cent., and more.

In the Salt Lake market the demand for the ferruginous silver ores of Cottonwood to mix with the silicious lead ores of Bingham has advanced rates to such a figure as to render profits a matter of too close calculation. The accepted bid for the January output of the South Star and Titus Mine offered $1.15 per ounce silver on the basis of twenty-five per cent. lead, with fifty cents per unit for all lead over that. Such prices will affect mine owners, unless they have "things fixed" for a sale, and I hear of a number of mines on which work has been started. Notable among these is the Grizzly. Nothing of consequence has been done at this mine for a year and a half past, but present ore prices, and from thirty to sixty-four feet of pay ore in the mine, is a strong temptation to realize. Rumor says that this mine will soon belong to the Sandy Smelting Co., which now owns the Montreal Mine in Bingham. As the Montreal has netted its owners some twelve thousand dollars per month for some time, the two mines combined would equal the best property in Utah. About the first of December last a report was circulated that the Bay City Tunnel had crossed the slip which cut off the Emma Mine, and had struck a large body of ore. The strike was said to be four hundred feet below the Emma workings, a safe distance, as the Emma company probably could not raise capital sufficient to sink after it. The story lacks authentic confirmation; there has been no ore shipped, and the stockholders may be asked for an Irish dividend on the strength of it. The North Star Mine, just above the Emma, leaves no doubt however, about there being ore in that neighborhood. Under Mr. BRUNER'S management, a former owner, this mine produced scarcely anything. It was finally sold by the Sheriff on a judgment for wages, and the miners *had* to buy it in. As a *dernier ressort* they worked the mine, following a cross fault, found ore and sold out for $75,000. In the last two months the mine has earned over $15,000. The ores are much the same as those of the Emma, viz.: about 200 ounces silver in the 1st class, and 70 ounces in the 2d. They are superior to those of the Emma in that they contain neither zinc nor silica, but about thirty per cent. of iron.

It is to be hoped that there is no truth in the notice, published in the *Tribune*, of an intended consolidation of the North Star with other mines of equally old titles for the ejectment of the South Star, Titus, Vallejo, and Flagstaff Mines. As this would but revive the war of "prior titles," supposed to have been laid to rest when HASKINS, WIGGINS and CONGER left the territory (for its good). From my knowledge of Emma Hill, to connect the North Star and Flagstaff, etc., would require greater experts, in hard swearing, than were brought out in the Emma vs. Illinois Tunnel suit. But, then, Utah can produce almost anything, even an "Ontario Mine." This mine was a hopeful prospect a year ago, on the development of which, the owners had spent over $100,000. About six months since, they leased the McHenry twenty stamp mill, and have produced from four to ten bars of silver, a week, since then, the value of which making a total of over a quarter of a million of dollars.

It is a pity that other companies do not follow the Chicago's example of showing the world what they have done; for a detailed authentic report* like theirs, helps our Territory more than any generalized opinion, and cannot be contradicted by the mining "bears," a curse almost as bad for a rising country, as the mo[illegible] [illegible]ous bulls in the same line. L.

Comparison of Results from Open-Topped and Closed-Topped Furnaces†

By FRANK FIRMSTONE, Glendon Iron Works, Easton, Pa.

IN 1871, two furnaces at the Glendon Iron Works, which had been blown out on account of the "coal strike," were altered from the open-top plan with side flues for collecting the gas, to closed-tops with cup and cone.

In one furnace the suppression of the side flues permitted a considerable alteration in the profile, but in the other (No. 5) no change in this respect was made; the side flues were simply bricked up and new ones cut through the sides close to the top.

This furnace was in blast for over four years, and we can, therefore, form a pretty good idea of the effect of the alterations on the furnace process.

The principal dimensions are: Height, 72′; greatest diameter, 18′; diameter at tuyeres, 8′; diameter of top, 10′; diameter at stock line (point at which the top of the materials is kept) 11′; cubic contents, 11,900 cubic feet.

The table below shows the average results for periods of twenty-six weeks each. 1st, of the open-topped furnace; 2nd, of the furnace with the first charger used, which was an ordinary cup and cone (diameter of cone 5′ 2″) 3rd, with the charger used ever since, a "double" cone 7′ 5″ diameter outside, having a central opening three inches in diameter. The diagrams (see supplement) show the daily variations in the grade of the irons for the same periods.*

	Average iron per week.	Average coal per ton iron.	Average grade.	Percentage of each grade.				
				No 1.	No. 2	Gray forge No 4.	Mottled No. 5	White No. 6.
26 weeks ending Feb. 25, 1871 (open-top.).. ...	291	ton cwt 1 3·8	3·9	3·9	25·7	34·5	19·5	26·4
26 weeks ending Feb. 24, 1872 (small cone.).....	271	1 6·5	3·8	6·4	22·4	39·3	18·3	13·6
26 weeks ending Feb. 22, 1873 (double cone.).....	291	1 ·41	3·4	19·1	25·4	24·3	15·7	15·5

* This report was published in a recent number of this journal.

† A paper read before the American Institute of Mining Engineers at the Cleveland Meeting, October, 1875.

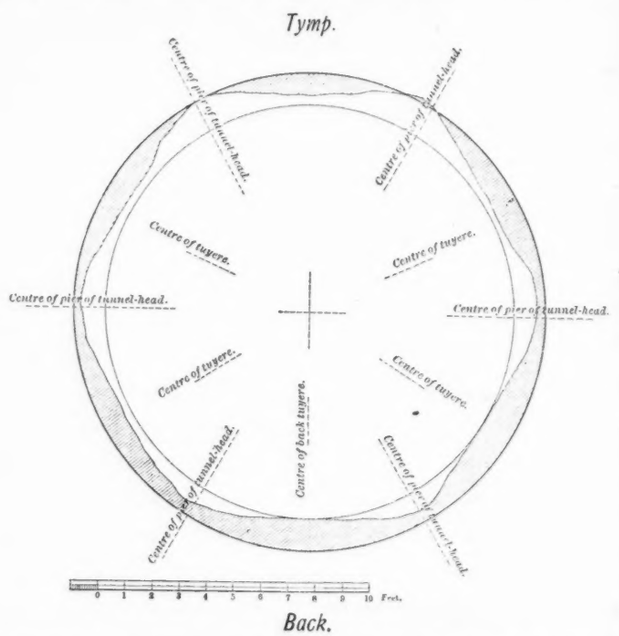
It will be seen at once, that the results with the single bell, were in all respects inferior to that previously obtained with the open-top.

The consumption of coal was higher, amount of iron per week less, and the working of furnace, as shown by diagram, very irregular.

Twice in this time, the bad working went so far that we lost all the tuyeres, and were compelled, in one case, to put a tuyere in the tymp and in the other to put tuyeres in the tymp and over the two tuyeres next to it.

Shortly after the last of these bad spells, we took out the small bell and put in the double cone. There was, at once, a marked improvement. There is little doubt that the first cone was much too small, and that, with a larger one, better work would have been done, and of course, correspondingly less advantage have resulted from the change to the double cone.

Comparing the 26 weeks of open-top working with the 26 weeks of work with double bell, we find the average weekly make, average grade of the iron and the coal per ton of iron nearly the same, but the regularity, both as shown by the diagram and by the percentage of the various grades made, decidedly less. In this respect, therefore, we are still behind what we did with the open-top. The diagram shows nothing as to the average temperature of the blast, as the record is not complete enough to permit it to be done properly. As far as it goes it shows that the average temperature now is higher than it was with the open-top, and that the variations from day to day are less.


Tymp.
Centre of pier of tunnel-head.
Centre of pier of tunnel-head.
Centre of tuyere.
Centre of tuyere.
Centre of pier of tunnel-head.
Centre of pier of tunnel-head.
Centre of tuyere.
Centre of tuyere.
Centre of back tuyere.
Centre of pier of tunnel-head.
Centre of pier of tunnel-head.
0 1 2 3 4 5 6 7 8 9 10 Feet.
Back.

Since we began to use the double bell, we have at times had the iron too thick to run into merchantable pigs, but have never been forced to raise the tuyeres or blow in the tymp. So far as we can learn, the experience at other works on the Lehigh, where the cup and cone was substituted for side flues and open-top filling with barrows, has been similar, although I do not know that such bad results as we had at the start at Glendon were met with any where else.

We may briefly notice some of the reasons for the changes caused by the alteration in the mode of filling and taking off the gas. These are due principally to the different distribution† of the stock in the furnace from that which occurs when it is dumped in, directly from the barrows.

When the material is shot in, off the cone, or is dumped in from the barrows, there is a tendency for the coarser and heavier lumps, both of ore and coal, to separate from the finer and lighter ones, owing to the greater distance to which they will roll; this causes some regions of the furnace to be more open than others, and thus affects the course of the gas, which of necessity takes the path in which it meets the least resistance. When a small cone is used, the coarse material, especially the coal, is found next the walls, the fine ore being in a heap in the middle, and the distribution is nearly like that obtained when the materials are thrown into the center of the furnace from a car with a drop bottom, which is probably, in most cases, the worst possible plan of filling. With a very large bell, the distribution will be precisely the opposite, the fine stuff lying against the walls, and the coarse rolling into the middle.

With the double cone, the effect is more complex, but in general there are two regions of fine materials, caused by the double discharge, and in any event, the separation will be much less marked than with a single bell, because the surface of the stock in the furnace is more nearly level and even, and, therefore, the distance through which the stuff *can* roll is much less.

With both the double and single bell, the tendency is to distribute the stock into rings, of (approximately) equal fineness, the diameters of which are governed chiefly by the relative diameters of the bell and the furnace at the stock-line.

In filling the same furnace with barrows through four or six doors, the distribution will be radically different. In the first place, the rolling of the stock, as it leaves the barrows, causes the coarser stuff to go to the center, but in addition to this, the spaces between the doors are filled by a sidewise rolling of the larger pieces. In this way the distribution is into sectors of varying coarseness, the finer stock lying opposite the doors, and the coarser in the

* In calculating the average grade of each day's iron, each twelve hours was taken by itself whenever more than two kinds of iron were made in the 24 hours, and the diagram drawn accordingly. By counting, it will be found that there were more such days with the single cone than with the "double" cone, and more with this than with the open-top.

† See DE VATHAIRE. Études sur les Haut Fourneaux, p. 95 et seq.

"dead" angles between them, while at the same time, in each sector, the stock becomes coarser in passing from the walls toward the center.

In two instances we have been able to see very plainly the effects of this sidewise rolling of the stock. In 1872 No. 2 furnace was allowed to go down to the top of the flues (about 12'), during a heavy snow-storm which prevented filling for several hours. It was then seen that the lining (9" thick when new) was worn through in seven places, six of which were exactly under the six piers of the tunnel head.

The wear was stopped at the top of the flues by a ring of castings built into the lining to prevent the stock from rolling into and obstructing them. The furnace was kept in blast until this upper part of the lining and the tunnel-head fell in, so that, after blowing out, no measurements of it could be obtained.

No. 4 furnace, 10' diameter on top, was blown out in March, 1874, after a blast of over five years, when the horizontal section of the furnace was as shown in the accompanying sketch. The grooves commenced about 3 ft. from the top, and grew wider and deeper as they went down, until they reached the point at which the section was taken (about half-way down), below which they gradually disappeared, and were lost a short distance above the tuyeres. If this example stood entirely by itself, we might attribute the grooves to the action of the tuyeres, but, considered in connection with what was seen at No. 2, we may ascribe them, without hesitation, to the unequal distribution caused by the six doors.

At first sight, it would seem that any mode of filling, which resulted in such unequal wear, would be unfavorable to the regular action of the gas and working of the furnace. To try this, and also with a view to increase the durability of the lining, the furnace when blown in again was filled through twelve doors, whereby the sidewise rolling was almost entirely suppressed.

The result was that the furnace worked with decidedly less regularity, and there was so much trouble from large lumps of spongy iron coming down over the tymp, that it was necessary to put a tuyere in the front and blow there constantly. It must be added, that but little benefit resulted from returning to the plan of filling through six doors, which was done after about ten weeks' trial of the new method.

The furnace was blown out in March, 1875, from want of coal, after a six months' blast, and gave signs of being badly scaffolded, among other things, making 35 tons of iron in the last 12 hours—more than had been made in any 24 hours through the blast.

The figures given above seem to show that there has been a slight but appreciable falling off in regularity, in changing from the open to the closed-top, Some closed-top furnaces, however, have done well, in respect of regularity. notably, the large furnace at the Musconetcong Iron Works (Stanhope, N. J.); but in this case, we have no comparable results, as the furnace was never worked open-topped.

For new furnaces, and, especially, for new works, the great saving in first cost, and the advantageous general arrangement which it permits, should cause the adoption of the closed top.

Some furnaces on the Lehigh have been altered back again from closed to open tops, and, in one instance, a new furnace has been changed from a closed to an open top, and, it is said, with decided improvement in the results obtained.

Price's Patent Retort Furnace.*

By I. LOWTHIAN BELL, M.P., F.R.S., Middlesborough, England.

THE ordinary reverberatory furnaces as employed for melting and puddling pig iron, or heating piles for the rolling mill, consist of a fireplace, a hearth for the reception of the material under treatment, and a chimney for securing the necessary current of air through the fuel.

All the operations in an iron works, with the exception of raising steam, require for their performance a very elevated temperature. Only that region, therefore, immediately adjoining the source of heat is available for any of the above-mentioned purposes; because, by the time we reach a distance of a few feet from the fireplace, the flame is cooled down below that point to which it is sought to raise the contents of the furnace.

The waste of heat, therefore, in every simple furnace, as described, is enormous, and various attempts have been made to reduce the amount of this loss. In former times, chambers between the hearth proper and the chimney were constructed, in which the iron received its first portions of heat. The extent, under any circumstances, to which this system is applicable in an iron works is but limited, indeed, practically, it was confined to the puddling process. Now, however, since the preliminary operation of refining has, generally speaking, been abandoned, this mode of economizing fuel has fallen into disuse.

In more recent times a considerable portion of the heat, which otherwise escaped into the chimney, has been intercepted by employing it as a means of raising steam. This application is sound in principle, because so far as a mere question of heat is concerned, there is no reason why the products of combustion might not be cooled down to 500 deg. or 600 deg. F., at which temperature a maximum intensity of drought is commanded.

When, however, the gaseous contents of the chimney have their temperature reduced to 1200 deg. or 1500 deg. F., the rate at which they impart heat to another body is so slow that there is no commercial advantage in preventing the loss inseparable from their escape, and even then the magnitude of the boiler arrangement is largely increased, compared with that when the fuel is applied direct for generating steam.

An important mode of rendering available a portion of the heat, which otherwise is carried off unutilized, is obtained by the so-called regenerative furnace. In it the fuel is employed in the gaseous condition, so that both the combustible and the air required for its combustion have their temperature raised, and, in this way, heat which would be lost is intercepted and returned to the point where it can be usefully employed. Compared with the ordinary reverberatory furnace, an economy of from 20 to 30 per cent. in the fuel consumed is stated to be effected by the regenerative system.

In the common furnace, the volatilization of the hydro-carbons in the fireplace is not only the cause of the expenditure of a certain quantity of heat, but the absorption of this heat tends to impose a limit to the power of the apparatus. This cooling effect, due to the evaporation of the volatile constituents of the coal, is augmented by the periodical introduction of the cold fuel, which is accompanied by the influx of a large volume of cold air. The result is a very prejudicial effect, both in respect to the economy of combustible and intensity of temperature. From this convenience, the continuous action and previous heating of fuel and air exempts the regenerative furnace. The preliminary conversion, however, of the coal into a gas, is attended with a certain amount of loss, inasmuch as the whole of the fixed carbon is burnt to the condition of carbonic oxide, which means a sacrifice of about 30 per cent. of its heating power. To this has to be added the cost of plant for doing this, and for heating the gasified fuel and air.

Mr. JOHN PRICE, of Sunderland, has contrived a form of apparatus which he distinguishes by the name of the Retort Furnace. In it Mr. PRICE raises the temperature of the air, as well as that of the gaseous and fixed constituents of the coal, by the waste heat before it enters the chimney. It is true he cannot compete with the furnace known as the SIEMENS, in the matter of intensity of temperature to which the substances employed as the source of heat are brought, but Mr. PRICE avoids the loss which takes place in the gas-producers of the so-called regenerative furnace. Whether the retort furnace can, or cannot, be applied to the manufacture of steel by the open hearth process remains to be proved; in the meantime, it is interesting to know that 26 lb. of wrought iron has been completely melted in a crucible by means of one of these furnaces.

Fig. 1. A is a combustion chamber, fitted with grate-bars in the ordinary way. B, a heating chamber, separated from A by the usual bridge. C is the neck descending into an underground flue, D, leading into an upcast or retort chamber, as it has been designated, E. In the center of the chamber (E) is a firebrick circular pillar, F, with spaces around, marked in Fig. 5, E E E E, and on which is placed a cast iron cylindrical air-vessel, G, which is protected by firebrick.

On this air-vessel (G) is built a retort, H, partly of firebrick, partly of cast iron. The top of the cast iron part of the retort is fitted with a hopper, I, in the throat of which is a damper, J, worked by a rocking-shaft and lever, K, from the ground.

The lower portion of the retort made of firebrick has two necks, L L, the one leading to the combustion chamber for the passage of fuel, the other to the outside of the furnace for the insertion of stoking-tools, to force the fuel forward into the combustion chamber. The entrance of the outer neck is closed by an air-tight door, M. The upcast or retort chamber (E) extends to near the top of the retort, where it is closed by brickwork, but is open at the side by the flue, N, leading to the stack, O.

Near the bottom of the chamber E, and in a line with the center of the circular air vessel G, are pipes PP, inserted in the walls of the chamber (E), passing all round the chamber as shown in Fig. 5. In front of the inner side of the circuit of pipes, and opening into the chamber E, are a number of port-holes Q Q Q (see Fig. 5), leading to the space around the pipes (P P), which space affords scope for expansion and a free circulation of heat. These pipes (P P) are connected with the blast as shown at E, Fig. 4, and pass into the central chamber G, as shown at F, Fig. 5. The outlet R from the air vessel leads into the ash-pit S (see Fig. 1).

The practice in working is to light a fire on the grate-bars, and generate heat in the usual manner, until the furnace is well heated. The retort is then filled with fuel, and the firing commences from the retort, and by the time the fuel at the top descends to the bottom of the retort, it is well heated, and a continuous supply of heated fuel is then kept up. All raw fuel is from this time supplied to the hopper (I) only, and let into the "retort" by the damper without the access of air.

The gases so generated in the combustion chamber (A) pass over the bridge into heating chamber (B), down the neck (C), into the underground flue (D), into the upcast or "retort" chamber (E), filling the spaces around, and giving up their heat to the circular air chamber (G), the retort (H), and the air pipes (PP), and their residue passing off by way of the flue (N) into the stack (O), the heat so stored being carried back into the furnace by the heated fuel. Combustion is supported by air under pressure from a fan. The air entering in as shown at (E), Fig. 4, traverses the entire circuit of pipes, passing into the central air-vessel (G), out through the outlet (R), into the ash-pit (S), and so up through the grate-bars.

It will thus be seen, from the description just given, that to some degree, the retort furnace embraces, in principle, that of the regenerative system; at the same time that the regenerative chambers, as well as the arrangement of valves for changing the direction of the current of the gases are dispensed with.

According to a return furnished to me, a single-bedded puddling furnace, working 12½ tons of pig iron per week, gave the following results:

	tons.	ct.	qr.	lb.	tons.	ct.	qr.	lb.
Pig iron delivered	188	15	0	0				
Scrap iron delivered	31	4	0	0				
					219	19	0	0
Fettling used					46	17	1	10
Coal					149	0	0	20
Received puddled bars	184	1	2	15				
Received scrap iron	28	7	3	15				
					212	9	2	2

Consumption per ton of Puddled Iron and Scrap Balls.

	cwts.
Pig and scrap iron	20·70
Fettling	·46
Coal	14·07

In the case of a double-bedded, puddling furnace working 25 tons of pig iron per week, I have received the following figures:

	tons.	ct.	qr.	lb.	tons.	ct.	qr.	lb.
Pig iron delivered	603	0	0	0				
Scrap iron delivered	82	11	0	0				
					685	11	0	0
Fettling used					70	0	1	9
Coal used					350	0	3	8
Received puddled bars	578	14	2	10				
Received scrap balls	75	0	1	15				
					653	14	3	25

Consumption per ton of Puddled Iron and Scrap Iron.

	cwts.
Pig and scrap iron	20·97
Fettling	·23
Coal	10·71

In both the trials, of which particulars have just been given, the furnace was worked by the draught of the chimney, and the air entered the fireplace at the temperature of the atmosphere. In the following experiment a fan was used, and the air was propelled through heated pipes, by which its temperature, before entering the fireplace, was heated to 300 deg. Fahr. The furnace was of the doubled-bedded description, and the work performed was 26½ tons of pig puddled in ten shifts, instead of 25 tons when using cold air:

* Paper read before the Iron and Steel Institute at Manchester, England.

	tons.	ct.	qr.	lb.	tons.	ct.	qr.	lb.
Pig iron delivered	26	5	0	0				
Scrap iron delivered	3	4	0	0				
					29	9	0	0
Fettling delivered					5	5	3	22
Coal					13	5	0	24
Received puddled bars	24	19	1	12				
Received scrap balls	3	0	0	0				
					27	19	1	12

Consumption per ton of Puddled Iron and Scrap Balls.

	cwts.
Pig and scrap iron	21.00
Fettling	.38
Coal	9.44

When the retort system was applied to a reheating furnace using hot air, the consumption of coal was as follows :

Cinder Bottom.

	cwts per ton.
Day-shift only, including lighting up	5.25
Working day and night	4.25

Sand Bottom.

Day-shift only, including lighting up	4.50
Working day and night	3.75

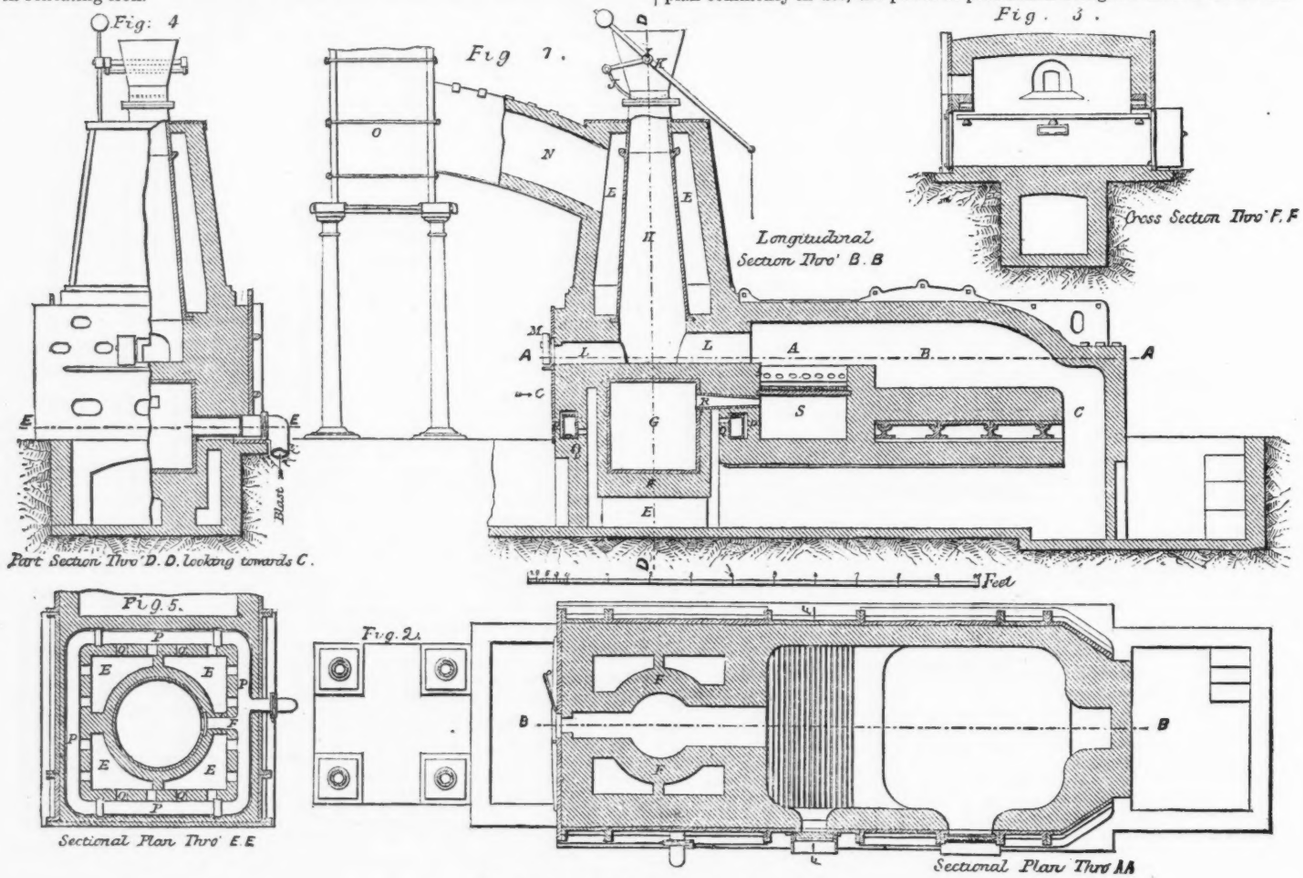
In the ordinary furnace, the coal consumed amounted to 9½ cwts. per ton of iron, working day-shift only, and 8 cwts. when going on uninterruptedly, so that the saving of fuel appears to be about one-third in puddling and one-half in reheating iron.

Carbonic acid	15.9 vols.,	or	22.8	by weight.
Oxygen	2.2	"	2.3	"
Nitrogen	81 9	"	74.9	"
	100.0		100.0	

The elevated temperature afforded by the apparatus at the period when the gases had the composition just described, may be judged of by the fact that 26½ lb. of malleable iron was perfectly fused in 2½ hours. The escaping gases, notwithstanding the intense heat of the hearth, only indicated 900 deg. Fahr., the flue itself not being visibly red hot.

Taking the heat evolved by the combustion of coal to be 8,000 units per unit of the fuel, that which escapes up the chimney in the gases at 900 deg. Fahr., may be roughly estimated at 15 per cent. of the whole. The loss from a furnace of the ordinary construction would, at the high temperature at which the products of combustion enter the chimney, be difficult to calculate, but at anything like 3,000 deg. Fahr., it would not be far from one-half of the heat the coal is capable of affording. The advantage, therefore, of intercepting the difference between 50 and 15 per cent., and of returning even a portion of it, so that it may be usefully applied, is obvious. That a notable amount of effective power which would be otherwise lost is so returned, is apparent from the figures, giving the consumption of coal which have been furnished to me.

A word or two with regard to cost of construction and of maintenance, which constitute important items of consideration in questions such as that we are discussing. Mr. WILLIAM PRICE informs me that the retort furnace for puddling can be erected at something like twice the price of one made according to the plan commonly in use, the power of production being the same in each case.



PRICE'S RETORT FURNACE.

From the examinations which were made of the escaping gases, it would appear that the nature of the combustion is capable of being controlled, and, in this manner, a flame of a more or less reducing character can be maintained. In one case, two piles of iron were placed in a reheating furnace, which, from their size, projected above the bridge, where they were exposed to the cutting action of the flame. To avoid waste from this cause, the blast was moderated to about half its usual volume, the effect of which was manifested in the nature of the escaping gases, which had the following composition :

Carbonic oxide	13.07 vols.,	or	13 39	by weight.
Carbonic acid	7.76	"	12.49	"
Hydrogen	7.35	"	.53	"
Nitrogen	71.82	"	73.59	"
	100.00		100.00	

The air was heated to 500 deg. Fahr., and the gases as they entered the chimney 1500 deg., as ascertained approximately by a pyrometer, the flue itself being visibly red-hot. This elevation in the temperature of the flue is, probably, due to the presence of so much unburnt inflammable matter in the gases, which would continue to burn on its way to the point of exit.

In the next experiment, the object sought to be obtained was the intensity of the temperature within command by this form of furnace, hence, the full equivalent of air, heated to 550 deg. Fahr., was employed ; indeed, the analysis of the sample of gases extending over three-quarters of an hour, show an excess of oxygen. Their composition was :

In the matter of repairs, his experience does not extend over a sufficiently long period to enable him to speak with precision. So far, however, as he can form an opinion, he thinks that the cost of maintenance is less, and that the retort furnace is more durable than the old kind formerly used. The retorts themselves promise, from present appearances, to last twelve months, in which case their renewal will amount to 3d. per ton on the iron puddled, 1½d. on iron reheated.

In conclusion, I may state that several of Mr. PRICE's furnaces are, and for some time have been, in operation at the Government Works, at Woolwich. I am indebted, for the particulars contained in this communication, to the courtesy of the officers of that establishment. The analyses of the gases given were performed in the Royal Laboratory of the Ordnance Department.

[Since Mr. BELL's paper was read we have been informed that one of Mr. PRICE's furnaces, which has been in use for a few weeks at Messrs. JOSEPH WITHAM and SONS, Leeds, worked for the two weeks ending September 25, with an average consumption of 7 cwt. 2 qr. 10½ lb. per ton of puddled bar produced, the average waste of iron over the same period being 5·3 per cent.]—*Engineering.*

Mr. James D. Weeks, late Editor of the *American Manufacturer* of Pittsburgh, has taken editorial charge of the Western office of the *Iron Age*. To Mr. WEEKS' able and industrious management the *Manufacturer* owed much of its success, and his loss, more especially when it is accompanied by a transfer of his influence, to its great rival, the *Iron Age*, cannot but affect our Pittsburgh contemporary. We congratulate the *Iron Age* on its acquisition.

Quicksilver Mines of California.

From the "Commercial Herald."

IN connection with the statistics of the Quicksilver trade on the Pacific coast for 1875, which we published last week, we add the following exhaustive statement of the various localities in California where it is found and the quantity produced:

The quantity of Quicksilver produced on the Pacific Coast in the year 1875 amounted to about 54,000 flasks. In this estimate is included an allowance of 500 flasks made to cover various small lots of metal ranging from ten to fifty flasks each, run out by parties owning deposits of limited extent or not yet much opened up, and who have mostly been restricted to the use of retorts alone. This is wholly the fruit of California mines, none of the other Pacific States or Territories have yet made any Quicksilver, though Cinnabar in small quantities has been found in some of them. The total production of this metal throughout the world now reaches about 100,000 flasks, of which California is at present turning out fully one-half. In a few years more the yield of this State will be likely to greatly exceed that of all the world besides. This commodity has been to us for more than a quarter of a century an element of large wealth, and in the aspect of its indispensable use and late high price, may almost be ranked as a royal metal. Until about ten years ago the New Almaden Mine was the principal, as it had before been almost the exclusive, source of Quicksilver production in California. In 1850, heavy production began here, 20,000 flasks having been run out that and the following year. In 1855 the quantity reached 31,860 flasks, falling to 10,588 four years after. In 1860 and 1861 the mine produced nothing, having been closed by injunction. In 1862, 34,765 flasks were made; in 1863, 40,391, and in 1865, 47,194, after which the yield gradually declined year by year, until it reached its lowest point, 9,084 in 1874. The ore from this mine yielded at the start as high as 36 per cent. of metal, but afterwards declined with slight fluctuations, until it fell to 4.87 in 1873 and 2.96 in 1874, all the low-grade ores being included. Of the entire world's production, England takes, on an average, about 45,000 flasks annually. The consumption on this coast absorbs about one-third the product, leaving the balance for export. The quantity used here is increasing rapidly every year, promising to keep pace proportionately with increased production, even should prices remain at present figures.

PRICES.

From 1858 to 1870 the prices of Quicksilver here ranged from 40 to 55c. per lb. averaging about 47c. For the next three years the average price was 93c.; in 1874, $1 37½, and last year about 80c. per lb. For some time to come the price will not be likely to go much above 75@80c.; nor will it probably fall below 55 or 60c., as the rapidly-increasing demand for mining purposes will prevent such accumulation as would tend to force prices downward, while the great abundance of the ore and the widely-distributed proprietorship of the mines will defeat combinations for controlling the market. Owing to the extent and richness of the Cinnabar deposits on this coast, and the facility with which the ores can be utilized, Quicksilver can be made here with fair profit when the price does not fall below 60c. Heretofore the markets of the world have been affected by certain speculative influences, rather than by the natural agents of demand and supply. Domestic combinations and foreign monopoly have kept them in a state of tension or relaxation, as best suited their purposes. If small lots of Quicksilver were thrown upon the London market, the ROTHSCHILDS at once depressed prices until they had secured these lots and checked further outside importations, when rates were again advanced to former figures. Under the enormous production hereafter to be made, this style of controlling either the home or foreign market will hardly be practicable. The exports of Quicksilver from 1859 to 1874 inclusive, amounted to 365,430 flasks, and, including exports of 1875, give a total of 394,390 flasks, valued at $14,289,591. The exports last year were 28,960 flasks, not including several thousand flasks shipped east by rail. The area of production has recently become so enlarged as to require some detailed notice of the more important Cinnabar localities lately discovered.

Beginning at the most northerly point in the State, where extended work is being carried on, we find a number of parties actively engaged opening up the rich deposits that for a long time have been known to exist in Trinity County. During the early days of gold-gathering on the upper waters of the Trinity River, fragments of a crimson-colored rock were found by the miners, intermixed with the gold dust, its weight being such as to prevent their easy separation. This "red stuff," so called, bothered the honest diggers not a little, interfering with their operations much after the manner of the celebrated "blue stuff"—the rich sulphurets of silver—at a later day vexed and bewildered COMSTOCK and his companions, when working below the great Washoe lode, the tracing up of which led afterwards to the discovery of that widely-famed deposit. To this material—the red sulphuret of mercury—little attention was paid for many years, no attempts at utilizing it having been made until 1873, when the high prices of quicksilver induced parties to commence gathering it in the vicinity of the locality now known as Cinnabar, where the surface soil over a considerable area contained these particles, of rich ore, much of which had been carried by the water and lodged along the adjacent ravines. Washing these ravines with rockers afforded the miners good wages for some time, when they finally came upon the veins from which these fragments had escaped, and which were found to be large and well charged with metal. In the early part of 1875 the reported richness of these deposits attracted the notice of certain San Francisco capitalists and miners, and they purchased the largest and most promising claim in the district, and having organized under the name of the Altoona Quicksilver Company, proceeded to outfit it in first-rate style. This mine is situated about 20 miles from Trinity Centre, and only 18 west from the line of the California and Oregon Railroad. The ore occurs in a regular contact vein, lying between serpentine and sandstone. It varies from five to twenty feet in width, the matrix being a decomposed sandstone. As the whole of this mass consists of workable ore, carrying from five to twelve per cent. of metal, this may be considered one of the most valuable discoveries of Cinnabar yet made in the State. It is a most remarkable fact that the entire mass of material standing between the walls of the lode is here removed and sent to the furnaces, none of it yielding less than four per cent. of metal. The surface of the vein has been uncovered for a distance of 400 feet, showing the ore deposit of uniform dimensions throughout. It has also been opened to a depth of 50 feet by means of tunneling, a second tunnel being now in progress to intersect it at a much greater depth. The drifts and cross-cuttings made show the ore on the lower levels in increased volume and richness, the regularity of the walls and the many stringers coming in pointing to continued fertility and permanence; the ore-body also undergoes a marked expansion with depth attained. In running the lower tunnel several blind lodes have been cut, of such power as to raise the question whether the one already opened is the dominating vein of the series, if, indeed, a mineral belt of extraordinary dimensions does not here cross the face of the mountain, carrying an indefinite number of heavy veins. The ore in these lateral fissures is all of high grade, varying from two to four per cent., some rich streaks going as high as twenty. Coming into possession of this property in July, the owners running three small retorts, making from three to six flasks per day, have since realized over $32,000 from the product of their quicksilver, the ore for supplying these retorts having been packed a distance of ten miles on mules. Having constructed a wagon road to the mines, a furnace has since been erected on the ground, which is now operating with a capacity to run out 300 flasks per month. As additional furnaces will probably be built very soon, there being an abundance of ore, there is no calculating what the yield of this mine may be before another year has passed by. The country here is heavily timbered and abounds in fine streams of water, affording every facility for the cheap operating of the mines. Not far from the Altoona are situated the mines of the Boston Company and several other promising claims, some of which are already out-fitted with reduction works, the most of them being yet of limited capacity, running only from ten to forty flasks per week. On the most of these claims systematic work is being done, and there is little doubt but some of them will prove to be valuable properties; the Boston claim being considered of scarcely less prospective value than the Altoona. It is, in fact, evident that a very important quicksilver field is about to be opened in the far north, and from which a heavy contribution to the yearly out-put of this metal may hereafter be looked for. The entire yield of Trinity County the past year was about 1,500 flasks, which amount, it is believed, will be six-fold greater next year. Coming south from Trinity, the next quicksilver producing locality met with, is in the Coast Range, Colusa County, where, but a little more than a year ago, much activity prevailed in the way of prospecting, locating, and developing the quite numerous but not very heavy deposits of cinnabar there occuring. In consequence of the decline in the price of this metal that took place early last year, this activity soon abated, only two or three claims continuing afterward to be worked. During the year the Abbott mine, with one small furnace, turned out about 250 flasks, the Buckeye made about 50, and the Sulphur Spring, 100 flasks, to which the Elgin, and some other small claims added, perhaps, 25 more, making a total production for the year of 425 flasks, on account of the mines in this county.

In Napa, Sonoma, and Lake Counties, a great cinnabar region is being opened up, although the prospects, considered so bright a year ago, have here, too, been somewhat obscured by the declining price of Quicksilver. The Redington mine, the largest producer in that section, makes, as it was expected it would do, a good showing for the past year, having taken out, during ten months actual running, 8,080 flasks of metal, their furnaces having remained inactive for the first two months of the year, to admit of needed alterations and additions. Toward the close of the year the out-turn was at the rate of over 1,000 flasks per month; an increment due to the more effective style of furnace introduced for treating a class of ores difficult of successful reduction by those formerly in use. Six furnaces, capable of handling 120 tons of ore per day, are now run on this mine, the ore supply for which is taken wholly from the stopes above the 200-foot level; exploration is, however, kept well in advance of extraction, the reserves here holding a two years' supply of ore. This company were fortunate in having a contract, to supply 400 to 500 flasks per month, during 1875, with FLOOD & O'BRIEN, at current market rates of Quicksilver. Owing to their prosperous financial condition at the beginning of the year, having large accumulations of cash brought over from the preceding year, this company claim to have been able to disburse dividends during 1875 to the amount of $453,600, besides defraying costs of many important improvements. Next to the Redington, on the list of largely producing mines in this section, stands the Sulphur Bank, in Lake County. This company own at that point what promises to be very valuable deposits of cinnabar, the ore being of good grade and easily extracted. The mine has been well opened and outfitted, and will hereafter be able to make a large and profitable production. The metal turned out last year amounted to 5,215 flasks, a quantity that will be materially increased the current year. The yield of the other more actively producing mines in that section for the past year, may be stated as follows: The Great Western, 3,384 flasks; the Manhattan, 437 flasks; the Buckeye, 700 flasks; the St. John's, 2,100 flasks; the Cloverdale, 714 flasks; the Phœnix, 300 flasks; the Great Eastern, 413 flasks; the additional small lots produced in this vicinity having amounted to about 1,000 flasks. The New Almaden mine made, last year, 13,648 flasks; the New Idria, 8,800 flasks; the Guadalupe mine, with but one small furnace, having turned out 3,415 flasks. The other small lots of metal produced elsewhere in the State will probably be covered by an allowance of 500 flasks. In San Luis Obispo County, another new field which this industry has invaded, a number of cinnabar deposits are being developed, and furnished with reduction works; the most noteworthy of this group, consisting of the Oceanic and the Sunderland, the only ones that have as yet been brought into a condition of considerable production. The Sunderland, with a furnace of 15 tons of daily capacity, ran out 1,500 flasks last year, a yield that will probably be doubled the present year. The Oceanic, with three furnaces, disposes of 75 tons of ore per day, turning out 200 flasks per month. This is a big mine and has sufficient ore developed to run the present furnaces profitably for years. The distinguishing feature of this property consists in the great amount of ore contained between the walls of the lode, and the facility with which it can be extracted. About 14 feet of ore is here broken down and passed bodily to the furnaces, being so nearly uniform in quality as to admit of little selection. This is probably the cheapest mine to work in the State, the labor force numbering scarcely more than half the usual average in mines of equal capacity. The product of this mine amounted last year to about 2,000 flasks, a quantity that might easily be, as it most likely soon will be, largely extended through the erection of additional furnaces and an increase of the working force. There are two or three other mines in this part of the State making more or less Quicksilver, their aggregate product reaching, perhaps, two or three hundred flasks per month, or 2,500 flasks for the past year. In at least a dozen other counties, scattered throughout the length and breadth of the State, cinnabar deposits have been discovered, some of which show good indications for permanence and wealth. A few of these have been partially opened up, and outfitted with retorts, and have produced from ten to fifty flasks of metal each, an allowance of 500 flasks being enough, no doubt, to cover all the Quicksilver made during the year by this class of mines.

TO BE CONTINUED.

SELECTED LIST OF PATENTS.

FOR THE WEEK ENDING FEB. 4, 1876.

RELATING TO MINING, METALLURGY, GAS MAKING, ENGINEERING, &c. REPORTED FOR THE "ENGINEERING AND MINING JOURNAL" BY LOUIS BAGGER & CO., SOLICITORS OF PATENTS, WASHINGTON, D.C.

172,403. Furnaces for Tempering Glass, T. B. A. Royer de la Bastia Paris, France.—The vat is covered by a table, adapted, when its contents are raked to the side, to be tilted off, to permit of the immersion of the articles on an endless belt. These are thus conveyed to a wire cloth basket, by which they are taken from out the liquid.

172,383. Ore Furnaces, I. I. G. Livermore, San Francisco, Cal.—The ore chamber is contracted just above the exit passages from the furnaces, so that full fire exposure is secured without clogging the passages. The escape flues discharge into a chamber encompassing the ore-chimney, which, by reason of its situation, heats the descending ore.

172,385. Ventilated Sewer-Traps, Jas. T. Campbell, New York, N. Y.—A trap-box placed, either inside of, or directly outside of, the building to which it is applied, and an air-pipe is arranged to pass up through the building to some place above the roof, whence the foul gases that escape through the trap may be discharged into the open air.

172,443. Machines for Welding the ends of Tubes, Albert L. Ide, Springfield, Ill.—The tube is griped with yielding pressure by a pair of automatically-operating jaws upon the forward movement of the carriage, the said jaws opening to release the same when the carriage is retracted.

The open heated end of the tube is inserted in a revolving die formed with spiral ribs or corrugations, which compress and draw it inward. The die is also formed with an axial opening, which furnishes a vent for all cinder, scale and surplus metal.

172,461. Chilled Car Wheels, Wm. W. Lobdell, Wilmington, Del.—This is a cast-iron car-wheel having a chilled rim from which the latent defects beneath the skin have been removed.

172,474. Manufacture of Gas, G. Olney, Brooklyn, N. Y.—Simultaneously mixes steam, liquid or liquefiable carbonaceous matter, and coal gas, previous to the entrance of the mixture into a heated retort by a steam-jet, steam liquid or liquefiable carbonaceous matter, and coal-gas.

Notes.

Poughkeepsie Bridge.—A contract has been made with the American Bridge Company, Chicago, for the construction of the long-talked of railroad bridge across the Hudson River at Poughkeepsie. The structure, according to the stated plan, will be a magnificent one. The water at that point is between fifty and sixty feet deep, the foundations of the bridge will have to go as many feet below the bed of the river to find an immovable bottom, and from the foot of the pier to the railroad track will be about 300 feet. The superstructure will consist of five truss spans of 525 feet each, which will be longer than any now existing. The contract price is said to be $3,412,000.

Price and Preparation of Graphite at Ticonderoga N. Y.—The miners are paid by the ton of prepared mineral, receiving therefor $125. The five grades of manufactured graphite are worth at present about five cents a pound for stove polish, 15 cents for powder polish, 50 cents for pencils and $1 a pound for stereotype powder. The first process after the ore leaves the mines is the stamping, by which it and its accompanying rock is reduced to fine powder; it is then washed dried in an oven, then bolted, like flour; after this it goes through a Bogardus mill, is again bolted, and then is known as crucible stock. If finer grades are needed additional processes are required.

A Wonderful Clock.—The Worshipful Company of Clockmakers have just printed a catalogue of the books, MSS., paintings, and prints relating to horology, together with the collection of ancient clocks, watches, and watchworks, preserved in their library and museum. These are now deposited in the Guildhall Free Library. The list, compiled by Mr. W. H. OVERALL, is a foundation for a bibliography of horology. Amongst the prints is one representing a very extraordinary clock, the production of JACOB LOVELACE, of Exeter. It took 34 years to complete the work; he died in 1716. The movements are—First, a moving panorama descriptive of day and night; day is represented by Apollo in his car, drawn by four spirited coursers, accompanied by the twelve hours; and Diana in her car drawn by stags, attended by the twelve hours, represents night. Second, two gilt figures in Roman costume, who turn their heads and salute with their swords as the panorama revolves, and also move in the same manner while the bells are ringing. Third, a perpetual almanac showing the day of the month on a semi-circular plate, the index returning to the first day of every month on the close of each month, without alteration, even in leap years, regulated only once in 130 years. Fourth, a circle, the index of which shows the day of the week with its appropriate planet. Fifth, a perpetual almanac, showing the days of the month, weekly, and the equation of time. Sixth, a circle, showing the leap-year, the index revolving only once in four years. Seventh, a timepiece that strikes the hour and chimes the quarter, on the face of which the whole of the 24 hours are shown and regulated. Within this circle the sun is seen in his course, with the time of rising and setting, by a horizon receding or advancing as the days lengthen or shorten; and under is seen the moon, showing her different quarters, phases, age, etc. Eighth, two female figures, one on each side of the dial plate, representing Fame and Terpsichore, who move in time when the organ plays. Ninth, a movement regulating the clock as a repeater, to strike or be silent. Tenth, Saturn, the god of time, who beats in movement while the organ plays. Eleventh, a circle on the face shows the names of the ten celebrated ancient tunes played by the organ in the interior of the cabinet every four hours. Twelfth, a belfry with six ringers, who ring a merry peal *ad lib tum*. The interior of this part of the cabinet is ornamented with beautiful paintings representing some of the principal ancient buildings of the city of Exeter. Thirteenth, connected with the organ there is a bird-organ which plays when required.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending Feb. 5

Tons of 2,240 lb.	1876. Week.	1876. Year.*	1875. Week.	1875. Year.*
Wyoming Region.				
D. and H. Canal Co	63,758	240,866	48,645	240,152
D. L. and W. RR. Co.	40,832	207,912	38,306	215,283
Penn. Coal Co	6,085	109,546	25,246	118,199
L. V. RR. Co.	18,187	109,173	14,694	89,092
P. and N. Y. RR. Co.	795	3,776	2 013	3,192
C. RR. of N. J	17,692	102,649	13,750	39,212
	147,552	773,922	142,654	705,733
Lehigh Region.				
L. V. RR. Co	36,455	176,256	44,933	273,528
C. RR. of N. J.	16,320	127,906	5,756	58,837
D. H. and W. B. RR.	116	2,853	826	8,296
	52,891	307,015	51,515	340,661
Schuylkill Region.				
P. and R. R. RR. Co.	76,374	220,350	51,017	200,303
Shamokin & Lykens Val.	8,194	22,800	5,126	40,276
	84,568	243,156	56,143	240,579
Sullivan Region.				
Sul. and Erie RR. Co.	1,376	5,659	459	2,939
Total	286 387	1,329,752	250,771	1,289,912
Increase	35,616	39,840	..	..
Decrease	..	..	..	..

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about seven per cent. of the whole production.

The receipts at Port Richmond for the week were 11,000 tons, shipments 5,000 tons, and balance on hand 149,000 tons.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania Railroads amounts to 1,416 tons, as compared with the corresponding period in 1875.

Perth Amboy business:

	Tons.
Received for the week	6,029
Shipped for the week	5,186
On hand Jan. 29	100,125

Receipts of Coal at Boston, for week ending Feb. 4, and years from September 1st, 1874 and 1875.

From	Week. Tons.	Previously. 1876. Tons.	1875. Tons.
Alexandria and Georgetown	—	53,052	45,700
Philadelphia	1,500	331,902	242,972
Baltimore	3,484	64,647	66,944
Other places	4,845	137,779	99,307
Great Britain	—	1,229	1,733
Nova Scotia	—	12,851	14,105

The Exports of Coal from Baltimore for the week were 255 tons, and since Jan. 1st, 3,557 tons, as against 4,627 tons for the corresponding period of 1875.

Belvidere Delaware RR. report.

	Week.	Year 1876.	Year 1875.
Receipts of coal at Coal Port (Trenton)	2,086	4,613	..
" " " South Amboy	8,288	77,003	15,160
Shipments of Coal Port (Trenton)	—	..	..
" South Amboy	7,305	32,682	25,572

The Production of Bituminous Coal for the week ending Feb. 5, was as follows:

Tons of 2,000 lb., except where otherwise designated.

Cumberland Region, Md.	Week, Tons.	Year, Tons.
Tons of 2,240 lb	17,203	94,967
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb	7,000	37,966
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	3,030	13,216
*East Broad Top	1,427	5,775
Clearfield Region, Pa.		
*Snow Shoe	832	3,710
*Tyrone and Clearfield	17,721	65,730
Allegheny Region, Pa.		
*Pennsylvania RR	4,252	15,859
Pittsburgh Region, Pa.		
*West Penn. RR	4,043	16,697
*Southwest Penn. RR	1,510	5,633
*Penn. & Westmoreland gas coal, Pa. RR.	14,776	54,040
*Pennsylvania RR	7,542	29,178
Kanawha Region, W. Va.		

* To Jan. 28.

The Production of Coke for the week ending Jan. 28.

Tons of 2000 lb.	Week. Tons.	Year. Tons.
Tyrone and Clearfield	..	..
Alleghany Region	..	..
West Penn. RR	80	3,500
Southwest Penn. RR	8,080	33,105
Penn. & Westmoreland Region, Penn. RR.	504	2,710
Pittsburgh, Penn. RR	6,541	18,643
Total	15,205	58,048

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Feb. 11, 1876.

Anthracite.

There is no improvement in the demand for anthracite coal; but the establishment of lower prices gives less room for underselling, so that the business doing is more evenly distributed. Dealers find it impossible during such mild weather as has prevailed, to move their stocks; and, with the prospects of even lower prices in March, there is no inducement to purchase further supplies now.

PROBABLE REDUCTION IN THE PRICE OF MANUFACTURING SIZES OF ANTHRACITE.

The Combination was in session in Philadelphia yesterday. The meeting is reported to have been very harmonious. The Pennsylvania Railroad Company is reported to be a party to the compact; Col. Scott having taken an active part in the proceedings of yesterday. It is said that the programme for 1876 is, in a general way, decided upon, and only lacks the arrangement of some minor details, which will be settled at a meeting to take place on the 17th inst. The only important piece of information that has leaked out is, that the opening prices of manufacturing coals will be considerably reduced below those at which they opened last year. We are led to believe, by good authority, that $3.75 at Philadelphia, and $4.25 at New York, will be about the prices.

Extensive Failures.—The announcement, on Wednesday, of the failures of E. A. PACKER & Co., E. B. ELY & Co., and BRAMAN & HARTWELL, all of Trinity Building, created more excitement in the coal trade than had been experienced there for a long time before. The immediate cause of these failures was the failure of S. R. SMITH & Co., of New Haven, with liabilities amounting to about $200,000, of which E. A. PACKER & Co. are creditors to the amount of $61,000, and BRAMAN & HARTWELL, $26,000; while other coal firms, including E. B. ELY & Co., are creditors for smaller amounts.

The firm of E. A. PACKER & Co. is one of the largest, oldest, and best known in the coal trade; it furnished all, or the greater portion, of the capital of the firm of BRAMAN & HARTWELL and had a special investment of $50,000 in the business of E. B. ELY & Co. The firm of BRAHMAN & HARTWELL has existed but a few years, is not extensively known in the trade, and is an offshoot of the firm of E. A. PACKER & Co. E. B. ELY & Co. have done a large commission business in coal, and are widely and favorably known in the trade. They are the lessees of the Beaver Meadow Colliery, in the Beaver Meadow district, having invested a large amount in developing their mine. They have just completed a large Breaker, at considerable cost, and were in a position to do a large business when overtaken by financial difficulties.

Much sympathy is expressed for the members of all these firms, but more particularly for Mr. E. A. PACKER, who, by his generosity and upright dealings, during a long series of years, has secured innumerable friends. At the present time, neither E. A. PACKER & Co., nor E. B. ELY & Co., are able to say positively how they stand, but think that they will be able to arrange with their creditors and resume business soon. These firms have considerable assets, which have no fixed market value, and would realize but little if peremptorily forced upon the market; while if they were given liberal extensions, these assets might be made to realize the amounts invested in them or the values placed upon them by the firms. The thoroughly honorable record of both these firms, is sufficient guarantee to the creditors that their interests will be fully and best protected by according such extensions as may be needed. On the 4th inst., S. R. SMITH & Co announced that they must fail if their creditors did not assist them. On the 5th inst., a conference was held in this city and it was decided to "carry them over" that day, with hopes of further help on Monday. On that day Mr. S. R. SMITH was here seeking the required aid which he was unable to obtain. On Saturday, E. B. ELY & Co. consulted, relative to their affairs, with E. A. PACKER & Co., informing them that they would require assistance on Monday,

which was partially promised in the event of a satisfactory arrangement being made with SMITH & Co., which, having fallen through, made it impossible for PACKER & Co. to give aid, hence the several failures.

We have been predicting for some time a similar occurrence to that related above. Many dealers were induced, early in the fall of last year, to stock up largely at combination prices, with the assurance that there would be no change before March. Others, however, had no more faith in the stability of prices than we had expressed, and held back to take advantage of the market, which soon offered them considerable concessions and enabled them to sell their coal at a low price, which the other dealers were compelled to meet at a loss. This, coupled with the mild winter, has made the coal business a very disastrous one, and many other firms have made the same request to be "carried over," so that the resources of the firms, whose failures we announce, were much reduced before R. S. SMITH & Co. made a demand on them. The failure of this firm is directly traceable to their dealings in real-estate, although, had their coal business been an ordinary one, they might have bridged over.

The Production of anthracite coal for the week ending Feb. 5th, was 286,387 tons, as against 345,592 tons for the week previous, and 250,771 tons for the corresponding week in 1875 The total production from January 1st, was 1,329,752 tons as against 1,289,912 tons during the like period of 1875. The above figures show a decrease for last week, as compared with the previous week, of 59,205 tons, and an increase of 35,616 tons as compared with the corresponding week of 1875. The total increase since January 1st, as compared with 1875, was 39,840 tons.

Bituminous.

There is but very little doing in this article of fuel; this, however, is not unusual at this season of the year. The Cumberland companies have done nothing towards reducing the cost of putting coal on board at tide-water shipping ports, although some of the Clearfield coals are offering as low as $4.50 at South Amboy, while it is pretty well understood that the price of manufacturing sizes of anthracite coal will open at about $4.25 at the New York shipping ports, and $3.75 at Philadelphia. With these facts before them it becomes imperative that the Cumberland companies take some early action in this direction.

Foreign and Gas Coals.—There have been no further important transactions in domestic gas coals, and nothing more can be said than we said a week ago. Foreign gas coals are quoting lower, but there have been no transactions in these.

Wholesale Prices of Anthracite Coal for Feb. f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
Lackawanna and Scranton at Hoboken and Weehawken	4 65	4 65	4 75	4 95	5 50	4 70
Pittston at Weehawken	4 5[illegible]	4 50	4 60	4 80	5 35	4 55
Wilkesbarre at Port Johnston	4 65	4 65	4 75	4 95	5 50	4 70
Plymouth, R. A., Act	....	....	4 75	4 95	5 50	4 70
Susque. Coal Co. at Amboy W.A.	4 65	4 65	4 75	4 95	5 50	4 70
Kingston at Hoboken	4 65	4 65	4 75	4 95	5 50	4 70
Lehigh Coals.						
Old Company at Port Johnston	5 25	..	4 90	5 00	5 50	4 85
Old Company's Room Run "	5 25	....	4 90	5 00	5 50	4 85
§Sugar Loaf, Hobok. & Amb."	5 25	....	4 90	5 00	5 50	4 85
Lehigh Coal Exchange "	5 25	....	4 90	5 00	5 50	4 85
Honey Brook Lehigh	5 25	..	4 90	5 00	5 50	4 85
Beaver Meadow at South Amboy	5 25	..	4 90	5 00	5 50	4 85
Schuylkill Coals at North 9th st., Brooklyn, E. D.						
Schuylkill white ash	4 65	4 65	4 75	4 95	5 50	4 70
Schuylkill red ash	....	..	....	5 05	5 55	4 70
Shamokin white and red ash	....	..	....	....	5 70	4 75
Lorberry	....	....	....	....	....	....
Lykens Valley	....	..	6 40	6 40	6 40	....

	Per ton.
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston to N. York.	45c.
" " South Amboy to New York	50c.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in NewYork.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 30	$5 10
" " at S. Amboy	5 50	6 10
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
" " South Amboy	8 50	..
" Orrel	6 00	6 50
Youghiogheny, Waverly Co., at Balt	4 25	6 00
Despard, West Va.,	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	6 00
Fairmount, West Va,, " "	4 50	6 00
Newburgh Orrel, Md. " "	4 50	6 00
Cannelton Cannel, W. Va., at Richmond	9 00	11 00
" Splint, " "	5 00	6 50
Peytona Cannel, " "	9 00	11 00
Straitsville " at Sandusky, O	3 25	10 00

Foreign Gas Coals.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne	9/6@11/	6 50@7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	42/	18 00@20 00
" Gas Cannel "	28/	13@14
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S	2 00	5 50
Caledonia, at Port Caledonia	1 75	5 25
Glace Bay, at Glace Bay	1 50	5 50
Lingan, at Lingan Bay	1 75	...
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75

Steam and House Coals.

Broad Top, at the mine, $1 25; at Amboy	4 75@5 00	5 25@5 50
Cumberland, at Georgetown and Alexandria, Va	4 00@4 25	5 25@5 50
Cumberland, at Baltimore	4 25@4 35	5 75@6 00
Clearfield and Allegheny, "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, 90; at Greenwich, Phil.	4 25	5 65

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$5 50	$5 80	$5 0
Lackawanna coal, delivered	6 75	7 00	6 25
Wilkes-Barre, "	7 00	7 25	6 50
Lehigh & Locust Mountain, del'd	7 25	7 50	6 75
Schuylkill Red Ash, del'd	7 50	8 00	

Our retail quotations of Pittston Coal are based on the actual selling rates of the company, nominal quotations of grate and stove are 2c c., and of nut 30c. per ton above these rates. The Cost of delivery ranges from 40 cts. to $1 10 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$23 00
Liverpool House Cannel " " "	25 00
American " " " "	15 00
Kanawha splint, " " "	15 00
American Orrel " " "	11@14
Red Bank Cannel " "	14 00
Cumberland " " "	9 00

Baltimore, Md. Feb. 8, 1876.

Reported by our Special Correspondent.

No change.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$4 80	$4 65
Broken	5 55	5 40
Egg	5 92	5 77
Stove	6 17	6 02
Nut	4 97	5 10
Shamokin. (red or white ash), and "Boston," freeburning white ash,		
Egg	5 95	5 79
Stove	6 15	5 99
Lykens Valley, red ash,		
All sizes	6 55	6 37

From wharf or yard, wholesale, 50@75c. additional.
By retail, all kinds and sizes, per 2240 lb. $7 00@8 00.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point	4 15	4 50
West Virginia f. o. b. at Locust Point		5 50
Youghiogheny Gas, f. o. b. at Locust Point		5 50
Swanton Coal, George's Creek		4 40

Boston. Feb. 8, 1876.

Reported by our Special Correspondent.

CARGO PRICES TO TRADE.

Lingan coal	$ 5 20	Westmoreland and Penn.	6 85
Caledonia	5 00	Waverly Co. Youghiogh'y.	6 80
Pictou	5 60	Cannelton Cannel	11 60
Block House	5 20	Cumberland	5 80@ 6 00
Red Bank Cannel	9 00	Anthracite	6 50@ 7 25
Glace Bay	5 00	" retail	7 50@ 8 00
Sydney	4 25		

Buffalo, N. Y. Feb. 8, 1876.

Reported by our Special Correspondent.

We enclose herewith a corrected list of prices for bituminous coal and coke. The changes are slight, and somewhat lower. Market dull. There is nothing special to report. It is understood that the Grand Trunk Railway will soon ask for proposals for a year's supply of coal for locomotive use, and this will provoke a lively competition among miners and shippers to this market, with a prospect of low prices.

Gas, steam, and cannel coals are offered, for the present, subject to our printed conditions, at the following prices per ton of 2,000 lb., delivered on cars at Buffalo:

ANTHRACITE.

	Afloat. f.o.b.	Retail, Deliv'd.
Grate	$6 40	$7 40
Egg	6 40	7 40
Stove	6 85	7 85
Nut	6 60	7 60

	Lump.	Run of Mine.	Nut.	Slack.	Nut & Slack.
Connellsville Coke	$5 15	....		....	....
Brookfield Coal	4 30	...	2 80	....	....
Briar Hill	....	....	....	....	....
Youghiogheny	4 75	....	....	....	....
Monterey	3 30	3 25	....	2 30	....
Catfish	....	....	....	....	....
Stoneboro	....	Bk'n	....	2 30	....
Cannel	5 50	4 75	4 50	....	....
Cameron	3 75	3 00	....	2 30	....
Reynoldsville	4 20	3 75	3 75	3 25	....

Chicago, Ill. Feb. 8, 1876.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.
Retail prices per ton of 2000 lb. delivered to buyer.

No change in prices of coal.

BITUMINOUS.			
Lehigh Lump	$10 50	Briar Hill and Erie	@ 7 00
Lehigh grate and egg	10 50	Walnut Hill, Pa	@ 6 50
Lehigh stove and chest	11 00	Midway, Pa	@ 6 50
Lackawanna, Wilkes Barre and Pittston*		Cannel	@ 8 00
Grate and egg	9 50	Blossburg	7 50
Stove and chestnut	10 00	Indiana Block	6 00
		Hocking "Brooks"	6 50
		Wilmington and Illinois.	5 00

* 50 cents off these prices for car load lots to country dealers and manufacturers.

Cincinnati, O. Feb. 8, 1876.

Reported by our Special Correspondents.

Please quote following rates on coal here:

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	7½c.	—
Pomeroy coal "	5 c.	—
Kanawha " "	7½c.	—
Cannel coal, according to quality "	16 c.	—
Semi-Cannel "	7½c.	—

The following are the retail prices delivered

Youghiogheny —c.	$3 00
Semi-Cannel —c.	3 50
Pomeroy 11c.	2 10
Cannel —c.	5 50
Kanawha Semi-Cannel —c.	3 00
Anthracite 10 00@11 00	
Coke, at yard 7c.	—
Coke, hard and soft, delivered 1cc.	—

Cleveland, O. Feb. 8, 1876.

Specially reported by Messrs. WARNER, BATES & CO.

WHOLESALE.

Per ton of 2000 lb. f. o. b. vessels.

	For vessels,	On cars.
Youghiogheny Gas Coal	$4 40	$4 15
Cannel	4 50	4 15
Blossburgh	5 00	5 00
Briar Hill Block Coal	3 80	3 60
Hocking Valley	3 25	3 10
Straitsville Coal Co., lower vein	3 25	3 10
Massillon	3 10	3 30
Tuscarawas Valley	2 85	2 70
Columbiana	2 80	2 60

RETAIL DELIVERED.

	Lump.	Nut.
Briar Hill	$5 00	$3 50
Massillon	4 50	4 00
Mineral Ridge	4 50	4 00
Columbiana	3 25	3 00
Straitsville Coal Co., lower veia,	4 00	3 00
Tuscarawas Valley	3 25	3 00

ANTHRACITE DELIVERED.

	Grate.	Egg	Stove.	Chestnut.
Lehigh	$9 00	$9 00	$9 50	$9 25
Wilkes-Barre	8 10	8 10	8 50	8 25
Lackawanna	8 10	8 10	8 50	8 25

Detroit, Mich. Feb. 1 1876

Specially reported by Messrs. ROBINSON & KEYS, Dealers in all kinds of coal.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep.sizes.	10 00	Briar Hill	7 50
Wilkes-Barre, Grate and Egg	9 00	Willow Bank	7 00
Wilkes-Barre, Stove and Nut	9 50	Erie	7 00
		Massillon	7 00

Erie, Pa. Feb. 8, 1876.

Wholesale, per ton of 2000 lb. Bituminous f. o. b.

Briar Hill lump	$3 75	Beaver lump	$3 50
Midway	3 25	Cat Fish	3 00

Indianapolis, Ind. Feb. 8, 1876.

Specially reported by Messrs. COBB & BRANHAM.

We quote coal in our market as follows:

Wholesale on board cars, and retail delivered to consumers. Per ton of 2000 lb., bushel of 70 lb.

BITUMINOUS.

IndianCreek, per ton	$2 75	Peytona cannel, per ton.	7 00
White River, "	2 75	Indiana Cannel	6 50
Brazil Block, "	2 90	Hocking Valley	4 25
Highland, grate, "	2 50	Youghiogheny	4 75
Block coal, nut, per car	18 00	Blossburg (smithing)	6 50
Highland " "	18 00	Piedmont "	6 50
Block Slack "	17 00	Gas coke, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre.)

Broken	$8 70	Nut	8 75
Egg	8 70	Stove	9 00

Lehigh Anthracite.

Broken	10 35	Nut	10 35
Egg	10 35	Stove	10 60

Retail, per bushel, delivered.

Sand Creek	16c.	Block Nut, steam	9
White River	14	" Slack, "	8
Brazil Block	15	Peytona Cannel	18
Highland grate	13	Virginia "	17
Block Nut, domestic use	12	Youghiogheny	22
Highland Nut, "	12	Blossburg	26
" " steam	9	Piedmont	26

GAS COKE(measured.)

Crushed 15c.	Lump 12c.

ANTHRACITE,

Wilkes-Barre and Lackawanna (all sizes)	$9 75 per ton.
Lehigh, retail	$11 50 per ton,

Louisville, Ky. Feb. 8, 1876.

Specially reported by Messrs. BYRNE & SPEED.

WHOLESALE.

per bushel		per bushel	
Pittsburgh	10c	Pine Hill	—
Raymond City	9c.	Kentucky	—

RETAIL.

per bushel		per bushel	
Pittsburgh	14c.	Peytona Cannel	20@22c.
Raymond City	13c.	Buckeye "	—
Pine Hill	13c.	City-made Coke	11c.
Kentucky	12c.	Anth., per ton,	$10 00 to 10 50
Screened Pittsburgh per load			$3 00
Screened Raymond City			2 75
Pine Hill (Kentucky)			2 75
Cannel			$5 to 5 50

Milwaukee, Wis. Feb. 8, 1876.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 00
Lehigh Prepared	11 00	Blossburgh	8 00
Lackawanna (all sizes)	10 00	Cannel	8 00
Pittston	10 00	Pittsburgh	7 00
Scranton	10 00	Steam coal	5 00

New Orleans, La. Feb. 8, 1876.

Specially reported by Messrs. P. & R. DE VERGES, Wholesale and Retail Dealers in Pittsburgh, Anthracite, Cannel and other Coals.

Pittsburgh coal, retail, per bbl	55c.
" wholesale	28c.
" steamboats, per box	50c.
" to manufacturers, per bbl	45c.
" shipments, per hhd	$6 00
Anthracite, wholesale, per ton	....
" retail, "	....
Virginia Cannel, per bbl	80c.
Scotch " "	80c.
Mt. Carbon, wholesale, per bbl	...
" " retail, "	....
St. Bernard, wholesale, per bbl	50c
" retail, "	....

Richmond, Va. Feb. 8, 1876

Specially reported by S. H. HAWES, Dealer in Coal.

Per ton of 2240 lb., f.o.b.

Kanawha Cannel	$9 00	New River Bituminous,	$4 50
" semi-Cannel	4 75	Clover Hill Coal	4 00
Coalburgh Splint	4 75	James River Bitum	3 30
Lewiston "	4 75	" " Carbonite,	5 80
Kanawha Gas coal	4 50		

San Francisco, Cal.

From the *Commercial Herald*, Jan. 27, 1876.

We have now to note the arrival of the ship *Dunmottar Castle*, from Newcastle, N. S. W., with 2,095 tons. The *Battle Axe*, from Swansea, with 920 tons, etc., The market for Australian, Wellington, etc., is firm. The supply of Cumberland is well controlled, and in casks held at $22: bulk, $18. Lehigh is plentiful and prices nominal. We quote Bellingham Bay at $8,50: Coos Bay, $10: California Mt. Diablo Steam, $6.25@8.25 for fine and coarse respectively; English and Scotch Steam, $9@10; Nanaimo, $9.50@10: Seattle, $9.50@10: Anthracite, $12@15: Lehigh, $14@15. The *Wasdale*, from Newcastle, N. S. W., brings 1,750 tons; *El Dorado*, from Seattle, brings 1,750 tons. At the close, the price of Wallsend from second hands has been materially advanced.

Toledo, Ohio. Feb. 8, 1876.

Specially reported by Messrs. GOSLINE & BARBOUR.

Per ton of 2000 lb. on cars.

Hocking Valley	$3 40	Massillon	4 00
S traitsville	3 40	Youghiogheny	5 00
Shawnee	3 40	Blossburg	7 00@7 50
" nut	2 90	Cumberland	7 00@7 50
Briar Hill	5 50	Connellsville coke	7 00

ANTHRACITE.

Grate, screened	$7 50	Stove, screened	$7 75
Egg, "	7 50	Chestnut "	7 50
Lehigh Lump	9 00		

40 cents to $1 per ton additional for delivery at retail.

Halifax, N. S. Feb. 8, 1876.

Prices per ton of 2240 lb. in gold.

Sydney (old mines)	$4 00	Little Glace Bay	3 35
Gowrie	3 35	Blockhouse	3 35
Victoria	—	Albion (at Railroad)	4 00

Toronto, Ont. Feb. 4, 1876.

Chestnut	$7 25
Stove	7 50
Egg and grate	7 25
Bituminous coal for domestic use	6 00
" " steam	3 50@5 50
Lehigh Lump and broken	7 50
Blossburgh	6 50

Montreal. Feb. 4, 1875.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Wholesale per ton of 2240 lb.

Scotch Steam	$6 00	Cape Breton Steam	$5 25
Pictou "	5 75	Newcastle Smiths	7 50

Anthracite at retail, per 2000 lb., delivered.

Egg	$8 50	Chestnut	8 50
Stove	9 50		

Rates of Transportation on Anthracite Coal to Tide Ports.

Lehigh and Wyoming Coals.

per ton of 2240 lb.

	From Penn Haven.	From Mauch Chunk.	From Hazleton**	From Upper Lehigh.	From Ashley and Sugar Notch.
To ‡ Newark, N. J. (117 miles), via Central Railroad of New Jersey	2 41	2 27	2 74	2 74	2 97
‡ Mauch Chunk, Pa., via Central Railroad of N. J.	14	..	56	47	71
‡ Philipsburg, N. J., (46 miles)	91	77	1 25	1 25	1 58
Elizabethp't, (114 m) Pt. Johns., Hoboken & South Amboy, N. J., shipping and wharfage 35c. add.	2 05	1 91	2 40	2 38	2 61
High Bridge, N. J.	2 40	1 95	2 80	2 54	2 72
Elizabeth, Cranford, Westfield & Elizabethport, for consumption,	2 41	2 27	2 74	2 74	2 97
¶ Jersey City, N. J., (121 miles) and New York, via L. V. RR.	2 85	2 40	3 17	3 24	3 54
Andover, via Delaware, Lackawanna and Western RR.	3 30	3 10	3 70	3 69	3 99
Trenton Somerset Junction and Greensburg, via P. RR. Belvidere Division	2 65	2 45	3 05	3 04	3 34
Trenton, (97 m.) for shipment, including shipping and wharfage	2 11	1 95	2 45	2 46	2 76

From *Mauch Chunk* to *New York* (121 miles), (towing limits) and Jersey City† via Lehigh Valley RR. $2 37

From *Mauch Chunk* to *Philadelphia* (93 m.) via L. V. RR. and North Penn. RR 1 75

††From *Phillipsburg, N. J.* to *Hoboken* (84 m.) for shipment via Delaware Lackawanna and Western RR., Morris and Essex Division 1 24

From *Lackawanna Junction* to **Auburn, N. Y.*, (191 m.) for shipment, via Southern Central R R. in connection with Pa. and N. Y. R.R. 2 53

From *Lackawanna Junction* to *Weedsport* (201 m.), for *Rochester and Charlotte* 2 59

From *Lackawanna Junction* to *Sterling* for *Oswego, N.Y.*. 2 62

‖ To this point for all places between Rochester and Buffalo the rate is 2 53

* The rate to this point for Syracuse is 2 08

** Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.

§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

¶ 20 cents per ton additional for transferring coal from boat to boat, and 30 cents per ton for reshipment of same from wharves.

† Transportation on Coal destined for re shipment from this point is 20c. less than above rate.

†† The rate for consumption to this point is $1 80.

The distances in the above table are computed from *Mauch Chunk*. From *Ashley* to *Mauch Chunk* the distance is 51 miles, and from *upper Lehigh*, 33 miles. From *Hazleton* 24 miles, and from *Penn Haven* 8 miles.

From *Wilkes-Barre* to *Perth Amboy* via the Lehigh Valley Railroad Company, the distance is 161 miles, and from *Mauch Chunk* it amounts to 106 miles.

Schuylkill Coals.

per ton of 2240 lb.

	From Pine Grove	From Tamaqua.	From Port Carbon.	From Mount Carbon.	From Schuylkill Haven.
To *Port Richmond*, for shipment, via P. & R. R. R., Main Line	2 12	2 07	2 00	1 99	1 92
Philadelphia, Retail yards	2 22	2 17	2 10	2 09	2 02
Harrisburg, via Lebanon Valley Branch	1 35	2 02	1 95	1 94	1 87
Allentown, via East Pennsylvania Branch	1 70	1 65	1 58	1 57	1 50
Lancaster, and Points on Lancaster Branch, via R. & C. R.R.	1 82	1 77	1 70	1 69	1 62
Dauphin, via Schuylkill and Susquehanna Branch	85	....	1 43	1 42	1 35
Slatedale Junction via Berks and Lehigh Branch	1 88	1 83	1 76	1 75	1 68
Lebanon, via Lebanon and Tremont Branch	96	....	....	....	....

From *Tamanend* to *Catawissa*, via Catawissa and Williamsport Branch Railroad 94

From *Tamanend* to *Williamsport*, via Catawissa and Williamsport Branch Railroad 1 39

Coal sent to points on the Catawissa and Williamsport Branch will be charged one and one-half cent per ton per mile, and two cents per ton additional to Tamanend.

The rates of freight and tolls on lump and steamboat coal (except that sent to Richmond for shipment) will be twenty per cent., and on broken coal will be ten per cent. less than the above rates.

ROBERT CROOKS AND CO.'S METAL REPORT.

LONDON, Jan. 27, 1876.

TIN PLATES.—Little buying is going on, makers in most cases refusing buyers' present bids. Should either decide on modifying their views considerable business will be done, as inquiries are very numerous.

PIG IRON.—The downward tendency noted in our last, continued until Friday, when the market opened at 63/ in the morning, from which an advance took place, closing in the afternoon with buyers at 64/. This week there has been a steady market, business being done at figures ranging from 63/ 6d. to 64/ 4½d., closing yesterday with buyers at 63/ 10½d. Makers' iron is slightly easier, as may be seen from the following prices: No. 1 Gartsherrie, 75/; Coltness, 80/; Summerlee, 72/; Monkland, 66/, f. o. b. Glasgow; Glengarnock, 71/; Eglinton, 65/, f. o. b. Ardrossan. Shipments for week ending 22d January, 6,288 tons. Stocks on 21st inst., 62,844 tons.

FINISHED IRON.—No change to report. Makers very dull, but they cannot attract orders by lowering prices till they get cost of raw material reduced. Crown bars we quote at £7 17/ 6d. to £8; of Staffordshire, or equal quality, and Clevelaud Welsh bars, lower in proportion.

TIN.—English is again lower, and now occupies the unusual position of being for L. & F. ingots, when terms are taken into consideration, about £2 cheaper than straits, which is ste dy at £79, while L. & F. ingots are £81; bars, £82; grain bars in barrels, £86; granulated, £88 per ton.

COPPER.—Easier—prices at date being—tough ingots, £87; best selected, £88; sheets, £96.

LEAD.—Smelters are becoming more ready sellers, and £22 15/ is a usual quotation for English pig, while one supplier is booking at equal to £22 5/, f. o. b. Liverpool. Other prices are: sheet, £24; water pipe, £24 6/; gas pipe, £25. f. o. b. Liverpool, less 2½ and 1 per cent.

FREIGHTS.—New York, 12/ 6d.; Boston, 7/ 6d.; Baltimore, 10/; Philadelphia, 15/; Montreal, 30/; Quebec, 35/; Toronto, 31/; Hamilton, 31/,

Freights.

Per ton of 2240 lb.

Representing the latest actual charters up to Feb. 10, 1876.

The following quotations are nominal, in many instances representing rates which have been ruling for some time past.

PORTS.	From Philadelphia.	From Baltimore.	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	....	2 40	....	....
Albany	*85	1 70	....	....
Amesbury, Mass	....	....	....	....
Bangor, Me	†2 00	3 00	....	2 10
Bath, Me	1 60	2 25	3 00	1 30
Baltimore	....	....	....	....
Boston, Mass	§2 00	2 00	2 50	1 50
Bridgeport, Ct	*85	1 50	2 00	90
Bristol, R. I.	....	....	2 10	1 00
Cambridgeport, Mass.	§1 90	....	2 50	1 50
Derby	....	1 65	....	....
Dighton	....	1 70	....	....
East Cambridge	1 90‡	....	2 60	§1 50
Fall River	1 50	1 50	....	1 00
Hackensack	....	....	....	....
Hallowell, Me	....	....	....	....
Hartford	....	1 65	....	....
Hoboken	†85	1 40	1 75	40
Hudson	....	1 65	....	....
Jersey City	....	1 40	1 75	40
Lynn, Mass	†2 10	.. ..	....	†1 50
Middletown	....	....	....	1 25
Mystic	....	....	....	....
Newark	....	1 50	....	....
New Bedford	1 50	1 60	2 10	90
Newburyport	2 10	2 25	2 65	1 75
New Haven	*85	1 50	190@2	85
New London	1 50	1 50	190@2	1 00
Newport	1 50	1 65	2 10	1 00
New York	85††	1 25	1 80	40
Norfolk, Va	85	60	60	....
Norwalk	85‡	1 50	....	80
Norwich	1 50‡	1 90	....	1 00
Pawtucket	1 75‡	1 90	2 20	....
Philadelphia	....	1 00	....	....
Portland	1 95	2 00	2 50	1 50
Portsmouth, N. H.	2 05@2 10	2 15	2 75	1 75
Providence	1 50	1 50	2 10	1 00
Petersburg, Va	....	90	....	....
Portsmouth, Va	....	....	....	....
Poughkeepsie, N. Y.	....	1 50	....	....
Richmond, Va	1 00	70	....	....
Rockport	....	....	....	....
Saco	2 50	....	....	....
Sag Harbor	....	....	....	1 00
Salem, Mass	2 00	2 00	2 60	2 05
Salisbury Pt., Mass	....	....	....	...
Savannah, Ga	....	1 50	....	....
Stamford	*85	....	....	90
Stonington	....	....	....	....
Taunton	.. .	..	....	....
Trenton, N. J	....	....	....	....
Troy	...	....	....	....
Warren, R. I.	....	....	....	1 00
Washington, D. C.	1 00	....	....	....
Wareham	....	1 75	....	....
Weymouth	2 00	2 00	2 60	....
Wilmington, Del	....	1 00	....	....
Wilmington, N. C.	....	1 50	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 3c. per bridge extra.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, Feb. ,11 1876.

American Pig.—There is a rumor of a sale of 1,000 tons Allentown No. 1 foundry, but we are unable to learn particulars. There are a few other sales reported on the basis of $23 for No. 1. The market, as a rule, is exceedingly quiet; much more so than a year ago. Prices, nominally, continue unchanged, although most well informed parties believe that all of the late large sales did not realize as much as $23. We quote No. 1 foundry at $23; No. 2, $21; and $18@$20 for gray forge.

Scotch Pig.—There is but very little business doing in this article. Prices remain unchanged here, although there has been a decline in the Glasgow market We quote Coltness at $32.50@$33; Eglinton, $29.50@$30; and Glengarnock, $31. Messrs. JOHN E. SWAN AND BROTHERS, of Glasgow, under date of Jan. 28, reported 117 furnaces in blast, as against 118 at the same date in 1875. The stock in CONNAL & Co.'s stores was 62,726 tons as against 62,844 tons on the 21st inst., and Jan. 28, 1875. The shipments since Dec. 25, show a falling off of 1,646 tons as compared with the corresponding period of 1875. They quoted Gartsherrie at 75/ for No. 1; Coltness, 80/; Summerlee, 72/; Glengarnock, 76/; and Eglinton 65/.

Rails.—There is nothing doing in these and the inquires worthy of notice are very scarce. We quote iron rails, at mills, at $42@$45, and steel $62@$65.

Old Rails.—We are reported a sale of 500 tons on private terms, and continue to quote at $21.

Scrap.—There is nothing doing in this article, which is quoted at $30@$31.

Philadelphia Iron Trade.

Weekly report of the Philadelphia Iron Market, furnished by Messrs. JUSTICE COX & Co., Iron Merchants, 333 Walnut street Philadelphia Week ending Feb. 10, 1876.

The iron market continues dull, with small sales for the immediate wants of the trade. No large transactions pending at this time, the sales, in the aggregate, making a fair business. We report sales of 100 tons Montgomery No. 1 in lots at $23 50; 150 tons No 2 at $21 50; 100 tons Chickies No. 1 $23 50; 200 tons Chickies forge, $22 at furnace. Forge or mill iron is exceedingly scarce, we hear of one or two cases of an advance of a doller per ton. We quote No. 1, $23 50; No. 2, $21 50; Gray Forge, $21 to $22, according to brand.

Bars.—There has been a fair business this week at last week's quotations, 2'5-10, although some of the mills hereabouts are quoting at $2 35. This is thought by many to be a price that cannot possibly last many days in the face of the advance of mill irons. Orders have not increased, and as it was hard to cover cost at 2'5-10 it will be harder to cover at $2 35. Something will have to give way, what that something is time will tell. We report the sale of 150 tons Catasauqua bars at 2'5.10, and quote $2 35 to 2'5-10 as to brand.

New Iron Rails are quoted dull of sale at $42@45 at mill.

Old " " quoted $21@25

Scrap.—Nothing doing at this writing.

Boston. Feb. 5, 1876.

PIG is very dull, the little work the foundries are doing seeming to be filled in with lots bought previously. The quotations range from $19 to 28 on all grades, and these figures are simply nominal indexes. New York advices continue reporting No. 1, $23; No. 2, $21 50; and gray forge, $15@19.

BAR has had a fair jobbing trade, but at a still lower basis, the general quotation this week being $50, a decline of $1 50 on our last reports. This has not been another sudden turn to values, but it is and has for a week been an occasional price, and on which our remarks of the case $51 50 have been predicated. At the point at which sales are now making, $50, there is no visible strength. This is $5 a ton tower than New York City dealers bill at, and $3 a ton under Philadelphia. It is fully $2 a ton less than any known private quotations from mills can show the stocks can be replaced at, and still iron is sold and iron comes in.

Our reports may possibly conflict with the business in other cities, and create no little anxiety at the producing points; but as business is coming here from distant localities never heretofore reached by the Boston market, the trade probably know just what they are doing. It may be a question of time as to how long this demoralization in values will continue, but while it holds out buyers cannot be very far from security in taking all they want. Common iron is wholly nominal; $45 is a quotation, but it is simply a guess. You can tell best what you can do in this grade when you make an offer.

STEEL is having a very light, and yet a steady business just now, scattering through all the different lines.

We quote American tool, 14@15c.; American machinery, 9@9½c.; Bessemer tires, 6¼@7¼c.; SWEET'S excelsior tire, 8½@12c.; English tool, 17@18c., gold.

COPPER is decidedly easy and although the combination make no reductions in quotations, those who advanced the wherewith to sustain the control have reduced their margins 1c. a pound, and urge a cessation of production. We quote 23 to 23⅜ c. for spots or futures.

For manufacturers we quote new sheathing 30c.; for bolts and braziers, 31c.; yellow metal bolts, 20@29c.

LEAD is steady with the Stock moderate and the demand light.

We quote pig 6c. for domestic and 6⅛@6½c. for foreign; sheet and pipe lead, 9c., currency; tin-lined pipe, 16 c.; bar lead, 9c., less usual trade or 10 per cent. discount.

ANTIMONY is firm, with a small inquiry at 13½c.

SPELTER is strong and quiet at $7.45, 30 days, and $7.35, prompt cash, a l currency. Silesian is dull at $7.75.

TIN is lower this week. The demand is trivial, especially for pig, which seems to be without much confidence. Plates are very irregular and sales are making below the cost to import.

We quote Straits 19c.; Banca, 23c.; Refined English 18½@19c., gold. We quote plates charcoal I. C., $7.50; coke, $6.75@7; and terne at $6.30@6.75, gold.—*Commercial Bulletin.*

Baltimore. Feb 9, 1876.

Specially reported by Messrs R. C. HOFFMAN & Co.

We have no change to note in the iron market since our last report. Sales have been made at quotations.

Baltimore Charcoal	$32@35	Anthracite No. 1	$21@22
Virginia Charcoal	28@34	Mottled and White	17@19
Anthracite No. 1	23@24	Charcoal C. B. Blooms,	72@75
" No. 2	22@23	Refined Blooms	60@65

Cincinnati. Feb 8, 1876.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

Below will be found closing quotations of our Pig Iron market.

CHARCOAL.

Hanging Rock, No. 1 Foundry	$25 00@	....	—4 mos
" No 2, "	23 00@24	00	—4 mos
" Mill	21 00@22	00	—4 mos
Tennessee No. 1, Foundry	23 00@24	00	—4 mos
Tennessee, No. 2, "	22 00@23	00	—4 mos
" Mill	21 00@22	00	—4 mos
Missouri, No. 1, Foundry	.... @	....	—4 mos

STONE COAL.

Ohio, No. 1, Foundry	22 00@23	00	—4 mos
" No. 2, "	21 00@22	00	—4 mos
Ohio Mill	20 00@21	00	—4 mos
Missouri, No. 1 Foundry	27 00@	....	—4 mos
" No. 2, "	26 00@	....	—4 mos
" Mill	26 00@	....	—4 mos

CAR-WHEELS.

Hanging Rock, C. B	40 00@50	00	—4 mos
Tennessee "	30 00@33	00	—4 mos
Missouri "	33 00@35	00	—4 mos
Alabama "	30 00@33	00	—4 mos

BLOOMS.

Charcoal	60 00@	75	00—cash

SCRAP IRON.

Cast	50c.@	65	—cash
Wrought	90@1	10	—cash

Chicago. Feb. 8, 1876.

Specially reported by Messrs. ROGERS & Co., dealers in

The following are the present quotation for pig metal in our market:

Scotch and American pig iron.

No. 1 Coltness	$38 00@	....	
No. 1 Gartsherrie	38 00@	....	
No. 1 Summerlee	37 00@	....	
No. 1 Glengarnock	36 00@	....	
No. 1 Eglinton	35 00@	....	
Warner's "American Scotch"	30 00@	....	
Massilon No. 1 Foundry	29 00@	....	
No. 1 Grand Tower Mo. ores (Bituminous)	29 00@	....	
No. 2, " " "	28 00@	....	
No. 1 Mill	25 00@	....	
No. 1 Foundry, Ohio	28 00@	....	
No. 2 " "	27 00@	....	
No. 1 Hanging Rock (charcoal)	28 00@	....	
No. 2 " " "	26 00@	....	
Union "A" 1 (Anthracite)	28 00@	....	
Union "B" 1 (Anthracite)	26 00@	....	
No. 1 Lake Superior (charcoal)	28 00@	....	
No. 2 Lake Superior "	26 00@	....	
No. 3 Lake Superior "	26 00@	....	
No. 4 Lake Superior "	28 00@	....	
Bessemer Steel Rails	65 00@	....	
New Iron Rails	45 00@	....	
Old Rails	28 00@	....	

Cleveland, Ohio. Feb. 8, 1876.

Messrs. C. E. BINGHAM & Co., quote as follows:

Per gross ton, on four month's time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.

No. 1, Lake Superior Charcoal	28 50@	....	
No. 2, "	28 00@	....	
No. 1, Anthracite	26 00@	....	
No 2, "	24 50@	....	
No. 1, Bituminous foundry	26 00@	....	
No. 2, " "	24 50@	....	
American Scotch, No. 1, Cherry Valley	29 50@	....	
" " B—1, " "	27 50@	....	
" " No. 2, " "	26 00@	....	
No. 1, Massilon	28 00@	....	
B—1, "	26 00@	....	
No. 2, "	23 00@	....	

CAR WHEEL AND MALLEABLE IRON.

No. 3 Lake Superior Charcoal	27 50@	....	
No. 4 " "	28 00@	....	
Nos. 5 and 6 " "	29 00@	....	

BESSEMER IRON.

Nos. 1 and 2 Lake Superior Charcoal	28 00@	....	

FORGE IRON.

No. 1, Gray	23 00@	....	
White and Mottled	22 00@	....	

Indianapolis, Ind. Feb. 8, 1876.

Specially reported by NELSON KINGMAN, broker and dealer in pig iron, etc.

Prices remain the same.

Trade very dull at prices named below.

New Rails at mill	$48 00@50	00	
Old Rails "	24 00@26	00	
Hanging Rock Charcoal Pig No. 1 foundry	28 00@29	00	—4 mos
" " " " 2 "	26 00@28	00	—4 mos
" " " Mill	24 00@26	00	—4 mos
Car Wheel C. B	40 00,	nominal.	

STONE COAL.

Indiana No. 1 Foundry pig Red Short	24 00@26	00	—4 mos
" 2 " " "	22 00@24	00	—4 mos
" 1 Forge " "	....@	....	—4 mos
" 2 " " "	....@	....	—4 mos
Ohio No. 1 Foundry pig Cold Short	25 00@26	00	—4 mos
" 2 "	24 00@25	00	—4 mos
" Mill	23 00@24	00	—4 mos
" No. 1 Foundry, Neutral	26 00@28	00	—4 mos
" No. 2 " "	25 00@27	00	—4 mos
Merchant Bar	2½c.		—3 mos
1st quality C. H. No. 1 Boiler Plates, per lb	5	c.	—3 mos
1st " Com. Sheet for No. 24, W.G. "	4	c.	—3 mos
1st " Charcoal Sheet " " "	5½c.		—3 mos
Best Bloom Galvanized Sheet, discount 20 per cent			—cash.
2d quality " " " 30 "			—cash.

f. o. b. in Indianapolis.

Louisville. Feb. 8, 1876.

Specially reported by Messrs. GEORGE H. HULL & Co.

The market is dull, but without change in prices.

The usual time, four mos., is allowed on the quotations below:

HOT BLAST—CHARCOAL.

No. 1 foundry, from Hanging Rock Ores	$25 00@26	00	
No. 2 " " "	23 00@24	00	
No. 1, Mill, from " "	—@	—	
No. 1. foundry, from Alabama, Georgia and Tennessee ores	23 00@24	00	
No. 2, foundry, from Ala., Geor'a and Tenn. ores	22 00@23	00	
No. 1, Mill, from " " " "	21 00@22	00	

HOT BLAST—STONE COAL AND COKE.

No. 1, foundry, from Hanging Rock ores	23 00@24	00	
No. 2, " " " "	22 00@23	00	
No. 1, Mill, " " " "	21 00@22	00	
No. 1, foundry, from Ala. Ga. and Tenn. ores	23 00@24	00	
No. 2, " " " "	22 00@23	00	
No. 1, Mill, " " " "	21 00@22	00	
No. 1 foundry, from Missouri ores	24 00@25	00	
No. 2 foundry, from Missouri ores	24 00@25	00	
No. 1 Mill, from Missouri ores	25 00@26	00	

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock ores	35 00@40	00	
" " Tennessee "	28 00@30	00	
" " Alabama and Georgia ores	28 00@38	00	
" " Kentucky ores	28 00@40	00	

Milwaukee. Feb. 8, 1876.

The pig iron market remains much the same. Prices are as follows:

per ton of 2,240 lb.

Frankfort L. S. Charcoal, No 1	$29	00	
" " " No. 2 & 3	28	00	
" " " No. 4 & 5	31	00	
" " " No. 6	33	00	
Mil. Anthracite L. S., No. 1	27	00	
" " " No. 2	26	00	
Wisconsin Iron, No. 1	25	00	
Mahoning Valley Bit's No. 1	30	00	
" " " No. 2	28	00	

Pittsburgh, Pa. Feb. 8, 1876.

Specially reported by A. H. CHILDS, Esq.

The metal market is quiet, with a moderate demand for good mill iron.

Foundry iron is in less request, but prices of all goods remain unchanged since last report.

No 1. foundry	$25 00@26	00	—4 mos
" 2, "	23 50@24	00	—4 mos
Gray forge	22 00@23	00	—4 mos
White and mottled	20 00@21	00	—4 mos
Warm blast charcoal	23 00@30	00	—4 mos
Cold blast " Western	40 00@50	00	—4 mos

Richmond, Va. Feb. 9, 1876.

Reported by ASA SNYDER, Esq.

Charcoal irons of established brands are firm at quotations, although transactions are small, I have no change to note.

Virginia Cold Blast Charcoal Pig Iron				$27 to $33	
" Warm " "		" "		24 to 28	
" " " Coke	" "	1 X		23 to 24	
" " " "	" "	2 X		21 to 22	
" " " "	" "	3		20 to 21	
" Anthracite	1 X			24 to 25	
" "	2 X			22 to 23	
" "	3			21 to 22	

San Francisco, Cal.

From the *Commercial Herald*, Jan, 27, 1876.

We have nothing of an encouraging nature to remark. Trade is dull in all departments and prices more or less nominal for Pig iron, Tin plate, etc. The ship *Cape Clear* from Liverpool, brought 5,570 bxs Tin plate, 270 tons Pig iron, etc. The *City of Melbourne*, From Sydney, brought 162 ingots Tin.

St. Louis. Feb. 8, 1876.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

We quote on four months' time:

Mo. Stone Coal No. 1 Fy.	$25@26		Massillon iron, A No. 1	31@32	
" " " 2 "	24@25		" " B " 1	29@30	
" " Gray Mill,	24@25		" " " 2	27@28	
" Charcoal No. 1, Fdy.	24@25		Cold Bl. Car Wheel, Mo.	38@40	
" " " 2, "	23@24		" " " Tenn.	33@35	
" " Gray Mill,	23@24		" " " Ala.	33@35	
Tenn. " No. 1, Fdy.	24@25		" " " Ill. R.	32@33	
" " " 2, "	23@24		Mo Charcoal Blooms	60@70	
" " Gray Mill,	23@24		" Scrap "	55@60	
Va. Coke, No. 1, Fdy.	25@26		" " hammered Billets	75@80	
" " " 2, "	24@25		Assorted Bar Iron 2 35, 90days		
" "Gray Mill,	23½@24¾		No. 1 Wrought Scrap	1 10 ch.	
H. R. Char. No. 1, Fdy.	26@27		Heavy cast "	95 "	
" " " 2, "	24@25		Light " "	60 "	
" " Gray Mill,	24@25				

Montreal. Jan. 25, 1876.

We quote pig iron Eglinton and Clyde $21 to 21.50; Carnbroe $21 50 to 22; American $24, to 26.; Summerlie and Calder $22.00 to 23.00; Langloan and Gartsherrie $22.00 to 23.00; Coltness $22.50 to 23.50; Hematite $30.00 to 31.00. Bar, per 100 lb., Scotch and Staffordshire, $2.25 to 2.30; best do., $2.50 to 2.60. Swedes and Norway $5.00 to 5.50; Lowmoor and Bowling, $6.50 to 7.00.—*Monetary Times.*

METALS.

NEW YORK, FRIDAY EVENING, Feb. 11, 1876.

Business is very quiet with prices somewhat confused and much depressed.

ERNEST W. G. MURRANT, Esq., of London, under date of January 28, says: "Values of most articles showed a tendency to recede in the past week, but no great disposition to operate was thereby induced, and the market remained dull at the close. The bank rate is reduced to 4 per cent."

Gold Coin.—During the week past gold has ranged from 112⅝@113, and closed at 113.

Bullion.—Fine silver bar is very much depressed and constantly declining, the present quotations being the lowest ever reached. To-day's quotations are as follows: New York, $1 18½ per oz.; San Francisco, 8½c. per disc., and London 54¼d. Fine gold bar continues very steady at ¼ per cent premium here; at San Francisco, par ($20 67 gold, per oz.); London, 77/9½d.

Copper.—There is a rumor that 8,000,000 pounds of Lake Superior copper has been sold, to the French government, to be delivered before August. If such a sale has been made the particulars are kept very quiet. It is generally believed that in case a sale was actually made, the price realized was between 21½@22c. It is known that an offer for 1,100 tons at 21c. was refused by the parties supposed to have made the sale. In addition to the above there were about 200,000 pounds sold at 22½@22⅝c. In the face of the rumor of the

abo e large sale it would appear strange that prices should show so much weakness; but the demand from manufacturers has been light, and there have been constant arrivals on the market, nearly sufficient to supply this demand. As we have before remarked, these overland arrivals are destined to give much irregularity to prices. London advices quote Chili Bars at £80 10/

Mr. MURRANT says of Copper: "The price of Chili is about a £ lower than that of last week, buyers appear to have almost become extinct, so rare is it to find any inquiry even for a retail lot. For Australian a rather better demand exists, but holders will not sell, as a rule under the top rates. At the Swansea Ticketing of Ores on the 25th inst., about 244 tons in fine with an average produce of 21 3-16 per cent. fetched an average price of 16s 10d per unit The week's sales reported by the Committee are 300 tons of g. o. bs. and named brands at £80 10s. to £82 for cash.

Tin.—This article is very quiet and still much depressed. Straits in lots of 1,000 pigs, is quoted at 18¼c., gold, per lb., and in small lots at 18¾c. L & F., in lots of five tons, is quoted at 18c. and in small lots at 18½c. There is no Refined English in the market. Banca is quoted at 22½c., gold, per lb. Singapore quotes $22 75 per picul for Straits tin The London quotations are so irregular and confused that we are unable to give the correct ones They range from £78 10/ to £81 for Straits.

Mr. MURRANT says of Tin: "In Foreign a limited quantity changed hands at somewhat reduced rates with rather sellers over at the close, the falling tendency not having been much checked by such purchases as were made. The Committee's report is 350 tons Straits and Australian at 78/ to 79/ 3d. for cash and shipment."

Tin Plates.—There is but little doing in these Prices, however, remain unchanged. We quote as follows: charcoal tins, $7.62½@7.75, gold, per box, and ternes $7.12½@$7.25; coke tins, $6.75 and ternes $6.25@6.37½.

Lead.—There is but very little doing in this article. About 75 tons of Domestic has been sold at about 6c., gold. Soft Missouri, in St. Louis, in quoted at 7c., currency, with freights here at 58c.

Spelter and Zinc.—Domestic continues firm at 7¾c., currency, with but little business doing. There is nothing doing in Foreign, which remains unchanged in price. Sheet zinc is dull at 8¼c.@9c., gold.

Antimony is quiet, at 11½c., gold, per lb.

Quicksilver is quoted at 65c., per lb., here; 60c. in San Francisco; and £11 in London.

The *Commercial Herald* of Jan. 27, says:—The market is s ack with but a moderate supply. The nominal price is 60c, but small sales for cash have been made as low at 53½c.

FINANCIAL.

New York Stocks.

FRIDAY, Feb. 11, 1876.

The prospect of lower prices for coal being announced in the Combination programmes, has had its effect in depressing coal stocks, a decline of over one per cent. is noticed in the shares of the Delaware, Lackawanna & Western RR., and the Central RR. of New Jersey.

The stock of the St. Louis & Iron Mountain RR. has advanced 2 per cent. during the week, with sales of over 2,000 shares.

Bonds are fairly active and generally inclined to higher prices.

We note the following transactions on the Baltimore Stock Market during the week: 1,000 shares of the Chesapeake & Ohio Canal, at 116; and 2,300 shares of the Santa Clara Mining Company, at from 16 to 17⅜.

Company Meetings.—The Fulton Coal & Iron Company, and the West Point Iron Company, held their annual meetings on the 7th inst.

A committee to consider the feasibility of a railroad from Hoosac tunnel to Pittston, Pa., reports, that such a road can be built for $25,000 a mile The distance by the proposed line will be at least 16 miles shorter than the Albany and Susquehanna route, and with much lower grades. The total cost of the road and equipment is estimated at $4,375,000, and the committee think it could at once do a business sufficient to pay the interest on its cost.

Quotations and Sales of Stocks and Bonds,

For the week ending Feb. 11, 1876.

STOCKS.

	Highest	Lowest	Closing	Shares sold.
Pennsylvania Coal Co	—	—	†280½	—
Consolidation Coal Co	49	47½	48	320
Spring Mt. Coal Co	—	—	64	20
American Coal Co	—	—	—	—
Maryland Coal Co.	—	—	18	—
Del., Lack., and West. RR. Co.	119	117⅝	118½	1921
New Jersey Central RR. Co.	109⅞	108½	108½	2295
Delaware and Hudson Canal Co.	121	119⅞	121	856
Quicksilver Mining Co. pref'd.	—	—	23½	100
" " Common.	17¾	17¼	17¼	400
Mariposa Land & Min. Co. various.	—	—	9¼	100
St. Louis & Iron Mountain RR.	22	20¼	22	2148
Lehigh & Wilkes-Barre Coal Co.	—	—	40	—
Total Shares sold				8100
Sales for the week previous				9522
Decrease				1362

† Nominal.

BONDS.

	Sales	Price
Ches. & O. R. R. 6s, 1st. coupon	27,000	30¾@ 31¾
" " " ex coupon	—	— @ 28
Central RR. of N. J. 1st Mtg. N.	10,000	— @115
" " " 1st Cons.	21,000	110½@111¼
" " " Convt.	8,000	110⅞@111¾
Del. and H. Canal, 1st Mtg. 84'	1,000	— @108⅛
" " 78, '77	1,000	— @102
" " Reg. '91	1,000	— @112
Del., Lack & W. R. R., 7s, conv.	1,000	— @118
" " " " 2d Mtg.	—	@109
St. Louis & Iron Mount'n 1st Mtg	10,000	96¼@ 97
St. Louis & Iron M'tn 2d Mtg.	4,000	— @ 64
Lehigh & Wilkes-Barre Cons.	45,000	98 @ 99½
Total Sales		$124,000

Closing quotations, in the absence of sales, represent the latest prices bid.

Philadelphia Stocks.

PHILADELPHIA, Feb 11, 1876.

We note a general decline, ranging from ⅛ to 2 per cent., in the Philadelphia Stock List, with sales of over 11,000 shares in excess of those reported in our last. Bonds are fairly active and lower.

Auction Sales of Stocks and Bonds for the week have been as follows, at the prices annexed:

$2,000 Lehigh Coal & Navigation Co.'s mortgages 7s (Greenwood tract) at from 97 to 99½

$5,000 H. & B. T. RR 7s, with coupons from April 1st 1871, at 63.

$5,000 Susquehanna Canal Co.'s coupons 6s at 76⅛.

8 shares Glendon Iron Co. at 60.

50 shares Penn. Gas Coal Co. at 56¼.

6 shares of the Chesapeake & Delaware Canal Co. at 19½.

40 shares of the Westmoreland Coal Co. at 84.

20 shares Little Schuylkill Nav. RR. & Coal Co. at 51¼.

Company Meetings.—The Glamorgan Iron Co. will hold their annual meeting on Feb. 15. The Mill Creek Iron Co., of Port Carbon, Pa., will hold a special meeting of their stockholders, on the 7th of March, for the purpose of holding an election for or against an increase of the indebtedness of the corporation to the amount of $300,000 by an issue of bonds secured by mortgages on all of its property to the above extent.

Quotations and Sales of Stocks and Bonds.

For the week ending Feb. 11, 1876.

STOCKS.

	Highest	Lowest	Closing	Shr's
Lehigh Valley RR. Co.	63⅞	62¼	62⅛	886
Pennsylvania RR.	55	54⅝	55	38250
Reading RR.	53½	50⅞	51¼	17034
Lehigh Coal and Nav. Co	51⅛	50⅛	50⅜	3985
Penn. Canal	—	—	9	—
Buck Mountain Coal Co.	—	—	*50	—
Fulton Coal Co	—	—	3½	—
Locust Mountain Coal Co	—	—	—	—
Westmoreland Coal Co.	—	—	84	—
St. Nicholas Coal Co	—	—	1	—
Cambria Iron Co	—	—	17	—
Crane Iron Co	—	—	46	—
Emaus Iron Co	—	—	—	—
Pennsylvania Salt Manufact. Co.	—	—	79	99
Total shares sold				60,254
Sales for the week previous				48,687
Increase				11,567

2 Asked.

BONDS.

	Sales.	Price
L and B. T. RR. 1st mortgage, 7s	5,000	— @102
" " " 2d " "	—	— @103
" " " 3d " cons	—	— @ 62
Lehigh Valley RR. Con. mtg. 6s, Reg	9,000	99 @100¼
" " 7s, 1910	18,000	113 @113¾
" " 6s coup	2,000	— @105
Pennsylvania RR. 1st mtge. 6s	3,000	— @104
" " gen. " coup. 1910	15,000	103 @103½
" " gen. " 6s, reg.	—	— @105
" " Cons. M. 6s Reg.	—	— @ 98
Phil. & Reading RR. 6s 45–80	10,000	103 @103½
" " G. M. 7s, reg. & coup.	8,000	— @113
" " " Deb. 6s	—	— @ 80
" " new convertible 7s.	1,100	105½@105¾
Phil. & Reading C. & I. Co. Deb. 7s	11,000	— @ 8½
" " Various tracts	7,000	89 @ 92
" " Mtge. 7s	—	— @ 89
Lehigh Coal & Nav. Co., 6s '84	5,000	104 @104¼
" " " RR, '97	—	— @104
" " " Con m. 7s	2,000	— @102
" " " Convt. gold, '97	5,000	— @105¼
Penn. Canal, 6s	—	— @ 70
Penn. and N. Y. Canal, 7s	3,000	— @109
Ches. and Del. Canal, 6s	—	— @ 88
Susquehanna Coal Co. 7s	—	— @ 85
Buck. Mount Coal Co. 6s	—	— @ 97¼
Penn. Gas Coal Co. 6s	—	— @100¼
Total amount of sales		$104,100

Closing quotations, in the absence of sales, represent the latest prices bid.

Gold and Silver Stocks.

NEW YORK, Feb. 11, 1876.

Mining shares are generally lower. Fluctuations during the week have been very slight, the present tendency of the list, however, is to higher prices.

Dividends.—*The Consolidated Virginia Mining Co.* has declared its usual monthly dividend of $10 per share, payable February 5.

West Comstock Mining Co.—This company has declared a dividend of 50c. per share, payable Jan. 24. This is the second dividend of this company.

Alps Silver Mining Co. declares a dividend of 25c. per share, payable Feb. 15.

Lyon Mill and Mining Co. declares a dividend of 50c. per share, payable on demand.

MINING NOTES.

California Mining Co.—An official letter, dated Jan. 30th, from the mine, says: "The winze sunk in cross-cut No. 5 from the 1,500-foot level has been connected with the north drift on the 1,500 level; in good ore all the way. The north drift on the 1,550-foot level is being advanced as fast as possible." The joint C. and C. shaft was 1,029 feet deep at last advices, and steadily progressing. This is a progress of 141 feet for the week ending Jan. 29.

Consolidated Virginia Mining Co.—The amount of ore extracted by this company for the week ending the 29th ult., was 4,371 tons, the receipts for the month amounted to $1,802,970.91. The average yield of the ore reduced during the last year was $98.82 per ton. A typographical error in our extracts from the Superintendent's report last week gave the yield at $8 instead of $98.82.

Crown Point and Belcher.—It is rumored that these companies have agreed to expend $275,000 in the erection of joint pumping machinery.

Savage.—A telegram from this mine, dated February 5th, says the water is still rising. The 1,900-foot drift is full. The pump and tank are running full capacity, the pump not being able to keep the water down.

Chollar Potosi.—The present weekly product of this mine is about 250 tons of ore, which yields an average assay value of $26.50 per ton.

Raymond and Ely.—A rich strike is reported to have been discovered in the bottom of this mine.

Northern Belle Mining Co.—The present weekly product of this company equals nearly 300 tons of ore.

Jefferson Mining Co.—The annual meeting of this company was held on the 28th ult. From the report of the Secretary we learn that the mine produced $217,754 in bullion, out of which a first-class fifteen-stamp mill and hoisting works were erected, besides paying $50,000 in dividends the past year.

San Juan, Colorado.—A dispatch to the Associated Press, dated Feb. 7th, states that unusually rich discoveries have been made in this district. Late assays conclusively show the presence of large lodes of gold-bearing ores of extraordinary richness. The Denver and Rio Grande Railroad will be extended to Cucharas by the 25th of this month. The track-laying is favored by excellent weather, and progresses at the rate of two and a half miles a day. This road will probably reach the eastern boundary of the San Juan gold region early in the spring, and thus place that important region within easy access.

The Bank of California has levied a second assessment of $10 per share, delinquent on the 28th inst The Chicago *Inter-Ocean* says: "An attempt was made by some New York stockholders to prevent the sale of stock which was delinquent under the former assessment; but the United States Court affirmed the lawfulness of the sale, and the stock was accordingly sold at auction, the buyers undertaking to pay the assessment."

With regard to the present surfeit of silver in San Francisco, the *Bulletin* of that city says: "The demand for the trade dollar in China is no longer equal to the supply of the mint here and at Carson, and the result is an over-abundance of that coin in circulation. This coin is now subjected to a discount of from four to five per centum; and this discounting is carried on in almost every branch of business. Even conductors on the street cars now refuse to take them for their face, and subject them to a discount of ten per centum. Other silver coins circulate in small quantities for their face value. There is no reason why any such distinction should exist. The trade dollar is as much of a legal tender for sums not exceeding five dollars as any other silver coin."

Assessments, with dates when delinquent: Eldorado (South) Idaho, $1, Feb. 4th; Meadow Valley, 50c., Feb. 5th; Andes, 50c., Feb. 6th; Enterprise Consolidated, 15c., Feb. 7th; Mint Gold and Silver Mining Company, 20c., Feb. 8th; Green, $5 on old stock, and 50c. per share on subsequent issues, Feb. 8th; Morgan (Cal.); 50c., Feb. 9th; Empire, 25c., Feb. 10th; Buckeye Water and Hydraulic, 50c., Feb. 14th; Cariboo (Plumas Co., Cal.), 25c., Feb. 14th; Gold Hill, 20c., Feb. 16th; Leviathan, 50c., Feb. 16th; Crown Point, $1, Feb. 17th; Savage, $1, Feb. 19th; Dardanelles, $1, Feb. 19th; American Flag, 50c., Feb. 21st; Albany (Quicksilver), 10c., Feb. 21st; Chollar Potosi, $5, Feb. 23d; Woodville, $1, Feb. 23d; Eagle, 50c., Feb 25th; Sunrise, 25c., Feb. 28th; Juniata Consolidated, 25c., Feb. 29th; Lady Washington, 20c., March 2d; Alta, 50c. March 2d.; Caledonia, $3, March 4th; Wells Fargo Mining Company, 25c., March 9th. The Indian Queen Mining Company of Mono Co., Cal., has levied an assessment of 50c per share.

Incorporations.—We note the recent organization of the following mining companies, with their shore capital and location:

Oneota S. Mining Company, $6,000,000 $100 shares, Esmeralda County, Nevada.

Swansea S. Mining Company, $5,000,000, $50 shares, Cerro Gordo Inyo Co., Cal.

Arizona Chief G. and S. Mining Company, $10,000,000 $100 shares, Mohave County, Arizona.

Servia and Slavonia S. Mining Company, $10,000,000, Elko County, Nevada.

Rising Star G. & S. Mining Company, $5,000,000, Eldorado County, California. (Gordon Valley Mining District.

Mount Washington Mining Company, $4,000,000, California.

North Sierra Nevada, S. Mining Company, $10,000,000, Nevada.

London Mill and Mining Company, $5,000,000, Nevada.

Mount Diablo Mill and Mining Company, $4,00,000, Esmeralda County, Nevada.

Meredith Mining Company, $10,000,000, Storey County, Nevada.

The Mackey Mining Company and the Edington Mining Company have incorporated, to mine in the same place, with the same amount of capital stock.

Argyle G. and S. Mining Company, $10,800 000, $100 shares, Gold Hill Mining District, Storey Company, Nevada.

Gold Flat Mining Company, $10,000,000, $100 shares Nevada.

Sunnyside Mining Company, $1,000,000, $100 shares, Plumas Co., California.

Grasshopper Mining Company, $3,000,000, Mosquito Gulch, Caloveras Co., California.

East California S. Mining Company, $10,000,000, Nevada.

Ormsby Mining Company, $10,000,000, Nevada.

Iris Mining Company, $10,000,000, Alta, Utah.

Lillian Quicksilver Mining Company, $10,000,000 $100 shares, Cinnabar District, Sonoma Co., California.

Germania Mining Company, $10,000,000, $100 shares, Nevada.

Union Consolidated Mining Company, $10,000,000, $100 shares, Cerro Gordo, California. (The above consolidation consists of the Union and San Felipe Mining Companies, and is the result of a long pending litigation between the parties. The suit has terminated by a compromise; a large increase of the bullion product is probable, as the mines are considered very rich).

The following Mining Companies have given notice of the increase of their share capital:

South Comstock G and S. Mining Company, from $4,000,000 to $10,000,000, in $100 shares.

Sutro Mining Company, from $2,400,000 to $10,000,000, in $100 shares.

Kennedy Mining Company. This company gives notice to their stockholders of a proposition to increase the share capital to $4,000,000, in $100 shares.

Mindeleff Reduction Company.—This company filed articles of incorporation in San Francisco on the 7th of January 1876, with a share capital of $5,000,000; object to mine for, or to purchase and reduce copper or other ores.

QUOTATIONS:

	No. of shares.	Feb. 2.	Feb. 10.
Sierra Nevada	100,000	$22	20
Union Consolidated	100,000	10	10
Mexican	108,000	19	19
Ophir	108,000	59	58
California	540.000	83	83
Consolidated Virginia	108,000	422	427
Best & Belcher	100,800	59	59
Gould & Curry	108.000	21	21
Savage	112,000	20	19
Hale and Norcross	16,000	54	47
Chollar Potosi	28,000	95	85
Alpha Consolidated	30,000	24	23
Imperial	100,000	9	8
Yellow Jacket	24,000	99	98
Kentuck	30,000	13	16
Crown Point	100,000	23	25
Belcher	104,000	34	32
Overman	38,400	65	60
Caledonia	20.000	32	32
Justice	105,000	28	27
Raymond & Ely	30,000	20	23
Meadow Valley	60,000	3	4
Eureka Consolidated	50,000	16	16
Eureka G. V.	20,000	3	3
Silver Hill	54,000	12	11
Julia	110,000	15	15

Copper Stocks.

Specially reported by Messrs. WILSON W. FAY & Co., Bankers and Brokers, room 7 Traveller Building, 31 State street Boston.

BOSTON, THURSDAY EVENING, Feb 10, 1876.

The market on Mining Stocks is as previously reported, and the business in them is even more limited than ever. Allouez is stronger, but is the exception. The Clique seems to be able to hold it, and can probably put it wherever they please. Calumet has weakened a little from 170, and closes 169 asked. Franklin has declined from 14½ to 14, and the same asked. National is steady at about 3.00 Pewabic is firm at 5.50 bid. Quincy is weaker at 41½ asked and 40½ bid. Ridge is weaker at 5⅞ bid, private sale being effected at 6.00. Duncan Silver has been very steady, ranging from 1.30 to 1.56. Nothing doing in Little Coppers.

The *Mining Gazette* gives the following as the copper product of the reporting mines for the month of January.

	Tons.	Lbs.
Calumet and Hecla	1034	885
Franklin 80 tons 225 pounds Pewabic 32 tons 35 pounds	112	260
Quincy	100	720

DESCRIPTION.	Par Value.	No. of Shares.	CLOSING. Bid.	Asked.
Allouez	$50	20 000	$24 50	$25 00
Calumet and Hecla*	20	80,000	167 00	169
Central	25	20,000	30 00	31 00
Copper Falls	25	20,000	4 00	4 50
Dana	25	20,000	14	18
Duncan Silver	20	60,000	1 30	1 40
Franklin	25	20,000	13 75	14 00
Humboldt	25	20,000	15	25
Madisca	25	20,000	25	30
Mesnard	25	20,000	65	70
Minnesota	25	20,000	2 75	3 25
National	15	20,000	2 87½	3 12½
Petherick	25	20,000	50	60
Pewabic	25	20,000	5 50	6 00
Phenix	25	20,000		
Quincy*	25	20,000	40 50	41 50
Ridge	25	20,000	5 75	6 25
Rockland	25	20,000	35	40
International Silver	—	—	21	23
Star	25	20,000	30	40
Superior	25	20,000	17	20
Eastern RR			11 25	11 50

Gas Stocks.

NEW YORK, Feb. 11, 1876.

A fractional advance in New York Mutual is the only exception to a still further decline in our quotations of Gas Stocks. Brooklyn stocks continue dull and heavy with a decline, in some instances, of $5 and $10 per share.

The Board of City Works, of that city, have authorized proposals to be advertised for to light the city, or any part of it, with oil or any other substance, under a resolution offered in the Board of Aldermen. The board will also begin the enforcement of the resolution recently passed in regard to cutting off all the churches of the city from the public gas-mains.

A new gas-light company, to be called the Mutual, has been organized in Brooklyn, having no connection with the New York company of the same name. Several reforms are promised by this company, and they are using every effort to get into immediate practical operation.

A large number of residents of New Brighton, Staten Island, have signed a card to the gas company of that place complaining of the high price of gas, and refusing to use any, if the prices are not reduced.

It is said that owing to the high price of gas in Indianapolis, Indianna, nearly one-half the town is using oil.

The Philadelphia *Ledger* says: "The annual report of the Philadelphia Gas Works shows that there are 653 miles of service pipe in that city; that in 1875 there were manufactured 1,873,199,000 feet, of which 1,262,565,870 feet were furnished to 86,299 private consumers, who have in use 1,191,394 lights. The average illuminating power of the gas was 16,61 candles The gas was furnished at $2 25 per 1,000 feet, and yielded a net profit of $302,986,21. On the 1st of March the price to private consumers is to be reduced to $2 15. the profits warranting the decrease. The largest consumption of gas in any twenty-four hours was on the night of the 31st of December, when owing to the general illumination of the city on the advent of the Centennial year the consumption amounted to 9,042,000 cubic feet. The works have paid the loans made in their behalf and the interest thereon, and thus have cost the city nothing."

The Elizabeth, N. J., Gas Co., will reduce the price of Gas from $3.50 to $3, per 1,000 feet, on the 1st of March.

A Sale of 35 Shares of the Chelsea, Mass., Gas Co. is reported to us at 132¾.

We note recent sales of some 1500 shares of the People's Gas, of Baltimore at from 25¾ to 26½, this is a decline of about one per cent. from our last quotation, which may be attributed the resolutions before the Maryland Legislature, which points to an investigation of the Gas Companies of Baltimore.

Dividends and Interest.—The Salem, Mass, Gas Co. has declared a dividend of 4 per cent.

The La Salle and Peru, Ill., Gas Light and Coke Co's. Coupons are due and payable during the present month.

It is rumored that the Brooklyn Gas Companies are considering the feasibility of reducing the price of Gas to 2.25 per 1,000 feet.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad st., N. Y.

Quotations "bid" and "asked" of New York City and Vicinity Gas Companies are on the $100 of stock and not on one share.

Companies in New York and Vicinity	Cap. Stk.	Par.	last Div.	When Paid.	Bid.	Askd.
			pr.c			
Mutual, N. Y.	$5,000,000	$ 100	2⅞	Oct. '75	110	110½
" " Bonds	900,00	1,000	‡3½	Aug. "	105	
NewYork, "	4,000,000		5	Jan. '76	151	151½
Metropol. "	2,500,000	100	5	Sept. '75	160	161
" " Certf.	1,000.000		3½	" "	105	106
" " Bonds	500,000	1,000	3½	July, "	105	
Harlem "	1,850,000	50	4	Feb. '76	132½	134
Manhattan "	4,000,000	50	10	Jan. "	245	248
Brooklyn, B'klyn	2,000,000	25	5	Nov. '75	205	210
Nassau "	1,000,000	25	4	July, "	100	108
" " Certf.	700,000	1,000	3½	Nov. "	95	98
People's "	1,000,00	10	3½	Jan. '76	70	75
" " Certf.	300,000	1,000	3½	July, '75	—	75
" " Bds	325,000	....	3½	Aug. "		100
Metropol. "	1,000,000	10	3½	May, "	70	80
Wmsburgh "	1,000,000	50	5	July, "	—	142½
" " Certf.	1,000,000	...	3½	July, "	100	101
Citizen's "	1,200,000	25	2½	Jan. '76	100	101½
" " Certf.	320,000	1,000	3½	Oct. '75	100	101
J. C. N.J.	380,000	20	5	July, "	160	170
Centl. Westch. N.Y.	466,000	50	4	July, "	100	105

‡ Gold.

Companies out of Town.†	Cap. Stk.	Par	Bid	Askd.
People's " " of J. C.			125	135
Citizen's G. L. Co., Newark, N.J.	1,000,000		75	80
Hempstead " " L. I., N.Y.	40,000	100		100
Jamaica, " " "	25.000	100		100
Richmond Co., S. I. "	300,000		100	105
Citizens', Rochester, "		100	60	68
Rochester Gas Co., "		100	50	
People's G. L. Co. Albany, "	1,000,000	100	31	40
Mutual " Buffalo "	750,000	100	55	60
Mutual " Detroit Mich.		50	14	—
TroyG. L. Co., Troy, N. Y.			108	
Brockport, N. Y., G. L. Co.	25,000	100		80
Baltimore G. L. Co., Balt., Md.	2,000,000	100	175	180
People's G. L. Co., Balt., Md	2,000,000	25¾	26⅜	—
Hannibal G. L. Co., Hanni., Mo.	100,000	100	95	100
La Clede, Mo				105
Lewiston G. L. Co, Lewis., Me	400,000	100	33	
Chicago G. L. Co., Chicago, Ill.	2,000,000	100	140	
Jacksonville, Ill.	120,000	100	82	
Lima, Ohio	60.000	100	10	
Derby G. L. Co., Derby, Conn.	160,000	100		80
Woonskt G. L. Co. Woonskt, R.I.	150,000	100	100	
Fort Wayne G. L. Co. F. W., Ind		100	90	100
North. LibertiesG. L. Co. Phila.		25	29	
Wilkes-Barre G. L. Co W. B. Pa.		50	70	
Washington G. L. Co., Phila.			42	43
Pottsville, Pa. Gas Co		50	40½	
Portland G. L. Co. Portland, Me	350,00	50	72	75
Hartford G. L. Co., Hartford, Ct	700,000	25	44½	
Boston G. L. Co., Boston, Mass.	2,500,000	500	780	785
Chelsea G. L. Co. Chelsea, "	300,000		139	
Cambridge G. L. Co., Cam., "	700,000		132¾	
Louisville G. L. Co., Louis., Ky.			127	
Cincinnati G. L. Co, Cincin, O.				200
St. Louis G. L. Co		50		160
Laclede G. L. Co, St. Louis, Mo.		100		110
Carondelet G. L. Co., Mo		50		6½
S. F. G. L. Co. San Francisco, Cal	10,000,000	100	97½	—
City G. L. Co. Montreal, Can.	1,440,000	40	137¼	139½
Consumers G. L(old.)Tor., Ont	600,000	50	132	
Hamilton G. L. Co., Ont.	150,000	40	112½	
Halifax G. L. Co., Halifax, N.S.	400,000	40	149½	150

† These quotations represent the latest obtainable prices at which sales were made.

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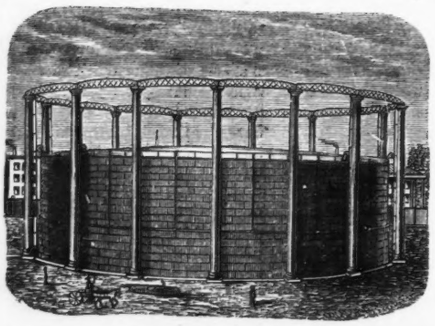

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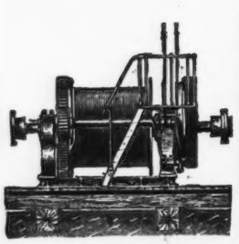

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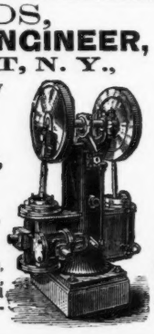

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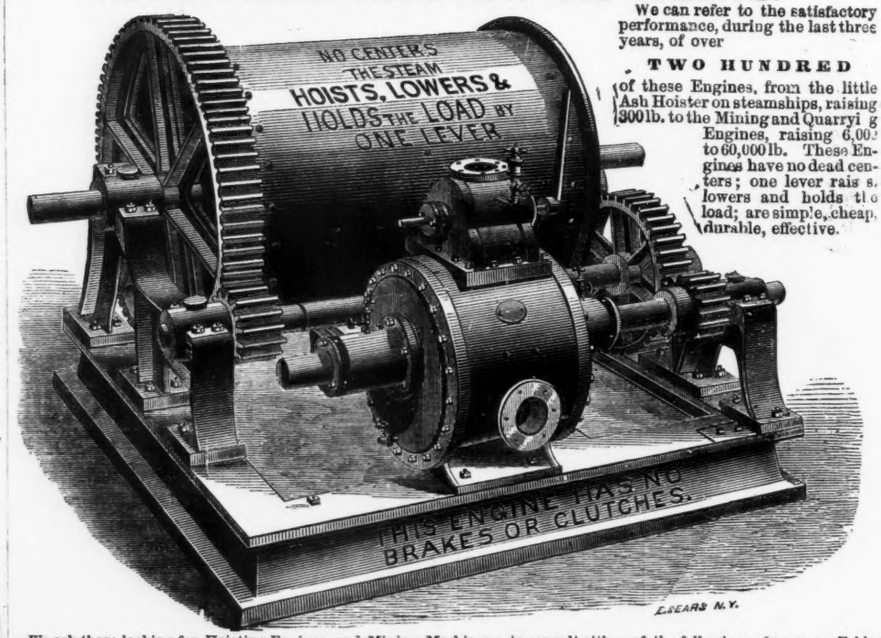

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